Complex Information Systems Development and Deployment Processes: A GT Study of TCK

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Declaration: The author hereby declares that, except where duly acknowledged, this thesis is entirely her own work and has not been submitted for any degree in Waterford Institute of Technology or in any other technical college or university.

Signed: _____

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Abstract

This research was a grounded theory longitudinal case study of a telemedicine centre in a post-conflict region. Rich studies of the development practices of advanced Information and Communications Technology (ICT) initiatives in developing countries are rare, and almost non-existent for post-conflict developing regions. The post-conflict context loaded additional factors into an already complicated systems development process.

The primary contribution of this research was to set out factors present in the case organisation which have received little attention previously in the academic literature and which were important in the successful implementation of a large scale telemedicine system in the Balkans. These factors have important implications for the design, development and delivery process for complex information systems projects in post-conflict regions, and incorporate a range of technical, social, political and cultural factors.

What emerges from this research is the symbolic role of hope and conflict in the project and the management of the political environment as the main factors which influenced information systems development success. These factors manifested themselves in practical ways during the information systems management activities associated with the deployment of telemedicine information systems and this is set out in the study.

The findings have important implications for our understanding of the dynamics of developmental ICT initiatives generally and in post-conflict, developing regions in particular. They also have implications for donor agencies that are providing support to post-conflict contexts as these regions develop important ICT infrastructure during the process of recovery.

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1. INTRODUCTION

The following section sets out the background, context and motivation for this research study. Aims and objectives are outlined, and from these preliminary research questions have been developed. This section concludes with a structure of the study.

1.1 Background and Context

The study of developing countries in information technology literature has been limited, and case studies of post-conflict developing countries almost absent (Stapleton, 2009). Comparably, information technology implementation and adoption has been extensively studied in the developed world (Geffen and Straub, 2000; Puri et al. 2004; Ifinedo, 2006). Information Systems Development (ISD) in a developing, post-conflict country adds both technical and behavioural complications to the already complicated process (Feng, 2006). Stapleton (2011) states that post-conflict countries pose a combination of unique and complex issues in IT development which impact on the success or failure of implementation and adoption, and need to be explored further (Stapleton, 2011). However, to date few studies have provided a deep analysis of large-scale complex IT adoption processes in post-conflict regions.

From the limited studies that have been conducted it has been found that the successful implementation and continued use of IT in Developing countries has been mixed. Issues such as gender, culture, politics, democracy, power, and control of information and knowledge, as well as technical and educational backgrounds all influenced the implementation and diffusion of IT (Jennex and Amoroso, 2002; Venkatesh et al., 2003; Puri et al. 2004; Roztocki and Weistroffer, 2011; Soja And Paliwoda-Pękosz, 2013).

Donor agencies and developed countries have worked towards implementation and diffusion of information systems, to build knowledge and growth in these countries, and to ensure economic survival in an increasingly globalised society (Puri et al., 2004;

Heeks, 2002; World Development, 1999: Venkatesh & Sykes, 2012). Systems have also been put into place at a local level, to turn around unsuccessful public administrations, and improve health and educational services (Sahay and Avagerou, 2002).

Government, both local and national, regulate and influence diffusion of information systems (IS). In many developing countries there is the added complication of an unstable or chaotic political structure. Molla et. al (2006) stated that in developing countries, especially those with a small population, even small institutional actions can have a large effect.

It should not be assumed that the issues affecting successful implementation of IS in developing countries are the same as in developed regions (Roztocki and Weistroffer, 2009; Ali and AlHinai, 2013) Different sets of variables impact on projects, so implementation must be tailored and balanced in a way that meets the local context (Ehn, 1993).

In post-conflict situations the set of success factors for information systems development are not well understood and urgently need analysis as the effective adoption of complex ISD can have a significant impact upon development in these most troubled regions (Stapleton, 2011). Given the amount of aid and other support injected into these regions, a revised theory of success in post-conflict ISD projects has potential implications for theory, policy, and education.

Ciborra (2002) argued that scientific model of discourse embodied in information systems development methodologies shifted our attention away from everyday human dealings with technology. He argued that they "dislodge the problem of human existence out of the development and use of systems and attempt to fill this ontological gap with the appearance of logic, objects, standards, and measurements. To, as concerned practitioners all over the world can testify, little avail" (Ciborra, 2002:104). This scientific model has elsewhere been described as techno-centric. Could it be that success in an ICT development in a post-conflict region can be understood in terms of

deeply human realities of existence? If so, then ICT development methods need to be more cognisant of these realities, rather than the techno-centrism criticised by Ciborra.

1.2 Post-conflict Regions: Importance of Understanding these Regions

Peace studies research treats post-conflict regions as those with particular needs in terms of security, advocacy and aid interventions (Anderlini & El-Bushra, 2007). Peace Studies research also reports that half of all civil wars result from unsustainable peace interventions in post-conflict regions (Collier et al, 2004). Economists regard post-conflict developing countries as having particular features, such as damaged infrastructure (and therefore low economic capacity), particular difficulties in attracting inward investment, and as having particular needs in the structure and distribution of aid, when compared to other developing regions (e.g. Sklias & Roukanas, 2007).

Post-conflict regions are typically the poorest regions, even compared to other developing regions. There is also the continuing threat of further outbreaks of violence or regressing back to war (Turner et. al. 2008). A post-conflict society is a traumatised society, where persons' previous assumptions about the world and their morals and values and priorities have been altered dramatically. Summerfield (2002) argues that recovery from this trauma is possible through resumption of everyday life: family, sociocultural activities, religion and economic activities. However in the post-conflict setting, resuming "normal" everyday life can prove difficult due to the social, political and economic upheaval and destruction.

Whilst some of the factors associated with post-conflict zones are also evident in other developing countries, the combination and intensity of the factors make post-conflict zones special cases. It is important to understand the processes by which information technology is adopted in post-conflict societies in order to inform policy and shape interventions which can help build and enhance economic activity.

1.3 Motivation

The adoption of information technology (IT) can play an important role in improving conditions in developing countries (Ahmed, 2007; Hamel, 2005). Understanding this, Internet technology adoption uses a key metric for one of the eight millennium international development goals set out and monitored by the United Nations (MDG, 2009). Complex information technology development and deployment initiatives in developing, post-conflict regions experience both technical and behavioural complications to an already complicated process (Feng, 2006). Stapleton (2011) states that post-conflict regions pose unique and complex issues in developmental ICT initiatives which impact on the success or failure of implementation and adoption. These need to be explored further.

What is needed is more empirical data which roots the understanding of ICT developmental initiatives in the problem of human existence. Human existence here refers to the systems professionals and users practical dealings with ICT development and deployment initiatives. Taking into account Ciborras assertions, and the fact that post-conflict contexts are poorly understood, longitudinal rich studies of the experiences of people involved in complex ICT initiatives in post-conflict regions could potentially make a significant contribution to our understanding of the real challenges faced and how those challenges are met and overcome. This in turn, should improve the success rate of large scale complex ICT initiatives, making better use of scarce resources, including international donor aid.

1.4 Research Aims

The aim of this study is to explore this previously poorly understood domain, and, from there, set out key factors ICT project teams encounter in post-conflict developing regions.

Post-conflict regions have particular features which are not encountered (at least to the same degree) in other regions. Ciborra and others direct IS researchers to pay particular attention to the realities of the experience of people in the particular context in which technology development and deployment happens. A set of histories and the existential context shapes peoples' sense of themselves in the project as a community of people trying to transform their world. These contextual realities also shape ICT developments and vice-versa. It is postulated that these realities significantly influence the success of these developments. Research has shown that ICT projects come to embody and symbolise peoples' hopes and fears and ICT development is a deeply symbolic process (Hirschheim and Newman 1991; Kendall and Kendall 1994; Schultze and Orlikowski, 2001). Symbolic meaning is complex, and often works subliminally. However, as indicated earlier, little empirical evidence exists from post-conflict regions which shed light on how these might influence ICT developments in large scale complex projects.

The primary objective of this research was to explore these factors in an ICT development initiative in a post-conflict developing region through the lens of everyday human existence and the symbolism which informs it.

1.5 Structure of Study

This thesis adopts a similar structure to other Grounded Theory studies of information systems development (Ovaska, 2005; Matavire & Brown 2008; Ovaska & Stapleton 2010). The first task is to provide the reader with an overview of the current literature. This is followed by an overview of the methodology. The research papers and book chapter produced from the execution of the methodology are then set out. The study concludes with a discussion of the main findings of the study, as seen in the research papers and book chapter.
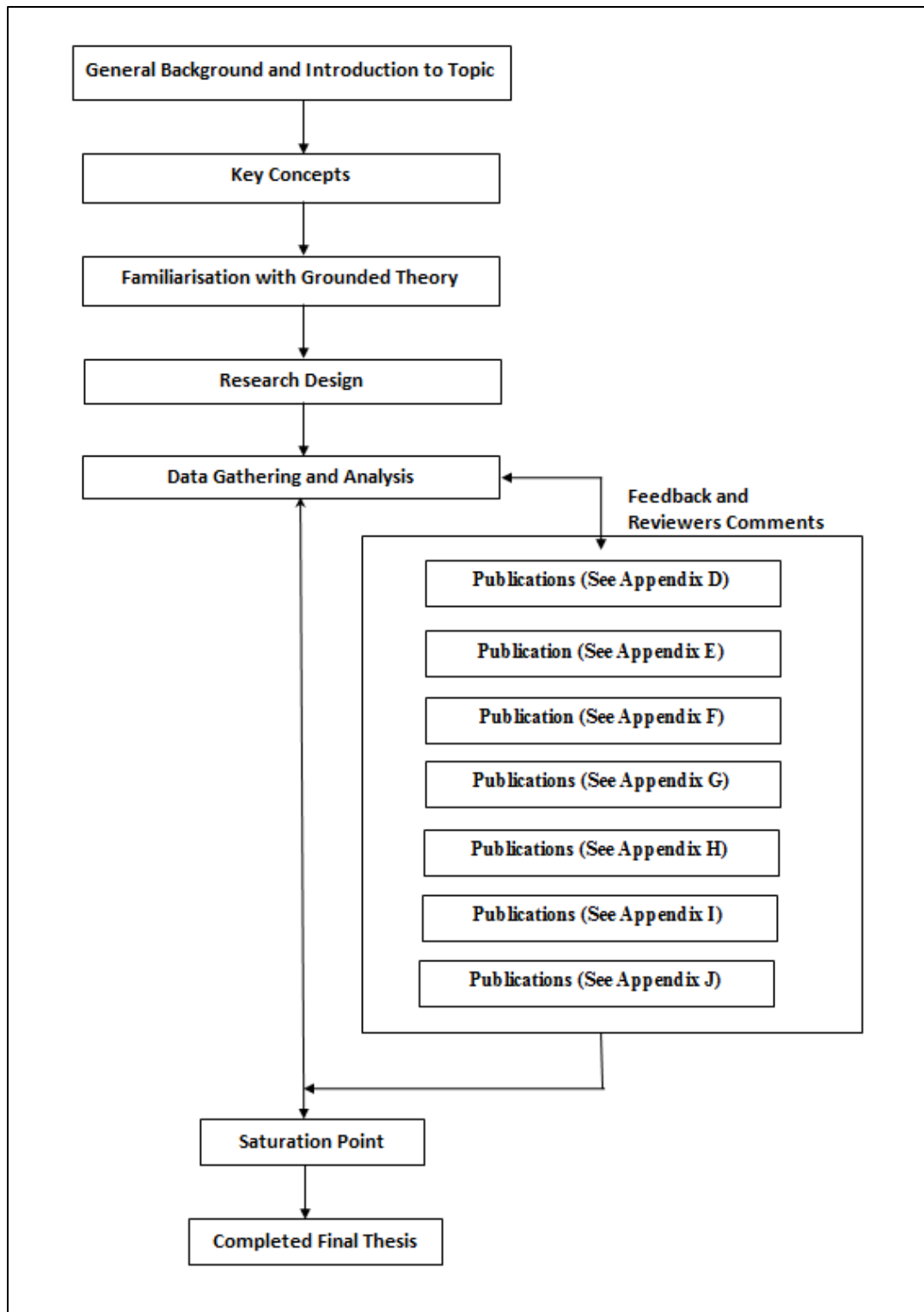
Figure 1: Overview of the Research Process

2. KEY CONCEPTS: SYMBOLISM, HOPE, CONFLICT AND INFORMATION SYSTEMS DEVELOPMENT

The role of this chapter is to provide the reader with overview of key concepts. This chapter sets out the terminology and key concepts found: symbolism, post-conflict regions, politics and technology development.

2.1 Success and Failure Factors in Developing Regions

Heeks (2002) classified success and failure of ISD projects in developing countries into 4 categories:

1. Total Failure: an initiative which was never implemented or in which a new system was implemented but immediately abandoned.
2. Partial Failure: in which major goals were unattained or in which there were significant undesirable outcomes.
3. Sustainability Failure (which particularly affects Developing Countries): an initiative that succeeded initially but then failed after a year or so.
4. Success: where most stakeholder groups attained their major goals and did not experience significant undesirable outcomes

Heeks (2002:2)

2.2 Post-conflict Regions and Ethnic Identity

Armed conflict is defined as "a battle between incompatible interests over government and/or territory where armed force is being used, and where at least one of the parties involved represent the national government" (Wallensteen and Sollenberg (1999:605). Gershenson and Grossman define conflict as "armed confrontation between groups that are contesting political dominance" (Gershenson and Grossman 2000:808).

2.2.1 Ethnic Identity

Ethnic identity incorporates shared perception of past events, expectations of future events, beliefs, religion, homeland, race, language (Ross, 2001; Ellingsen, 2000). Smith (1986, 1999) describes ethnic identity as a social construction of 'myth symbol process' with symbolism at the heart of it. Part of the myth symbol process in regions where there is ethnic conflict is the narrative of a long, ongoing dispute, which symbolises the fears, challenges, humiliations, past traumas of a particular ethnic group (Ross, 2001). Volcan refers to a particular type of narrative as a "Chosen Trauma": experiences which a group incorporates into their identity and passes on through the generations, these experiences are evoked in times of intergroup conflicts (Volkan 1988, 1997).

2.3 Conflict in Kosovo

The significance of Kosovo in the expression of the Serbian identity can be traced back to the Battle of Kosovo in 1389. In this battle Serbian forces were beaten by Turkish forces, on a battle field which lies just 5km north of the Kosovo capital Pristina. This battle and the myths and legends that surround it are at the heart of Serbian identity. During the centuries which followed, Kosovo came under Serbian rule, the Ottoman Empire, and later became part of the new state of Yugoslavia after World War I (Wilson, 2009).

Albanians began to move into Kosovo in large numbers in the 15th Century, and by the late 17th century, with increasing Ottoman Empire activities, many Serbs had left the region and relocated north to Belgrade, now the current capital of Serbia. During this time the population of Kosovo was very low, and many Albanians resettled the region.

The early 19th century saw the beginning of a stronger Serbian presence in Kosovo, and at the end of the first Balkan war in 1912, Serbia were in control of the region. This led to much anti-Serbian feeling in Kosovo from the now majority Albanian community.

After World War I (1914-1918) the state of Yugoslavia was formed. Yugoslavia consisted of the republics of Serbia, Croatia, Slovenia, Montenegro and Macedonia. Kosovo remained an integral part of Serbia. At this time it is estimated that 64% of the population were Albanian.

During World War II (1939-1945) Germany had conquered Kosovo, but it was put under Italian control along with Albania. As the war neared a conclusion Albania and Kosovo came under German control. The Albanian community increased as Serbs fled. In the aftermath of World War II Serbs who had fled were not allowed to return.

The end of World War II marked the beginning of the communist era in Kosovo, as Tito (Josip Broz Tito: 1892 – 1980) came to power. Kosovo was defined as an autonomous region of Serbia, under Yugoslav rule. Diplomatic ties to Albania were cut in 1948 and closer ties built with Russia.

Albanian nationalism within Kosovo increased in the decades which followed. Throughout this time Serbs continued to leave the region, and Albanians to move into the region (Malcom, 1998).

Kosovo retained a high level of autonomy up to the late 1980's, with estimates of between 80% - 90% of its population ethnic Albanian (Ron, 2001; Wilson, 2009). In 1989-1990 the issues arising from the disintegration of Yugoslavia resulted in the abolition of Kosovan autonomy. Many of the regions different provinces accused each other of discrimination, violent unprovoked attacks and political repression. This era was marked by a celebration of the 600th anniversary of the Battle of Kosovo, during which the Serbian leader Slobodan Milosovic made a speech at the Gazimestan monument (a tower built in 1953 to commemorate the Battle of Kosovo which took place in 1389) to rally Serbian nationalist feeling. Anti-ethnic Albanian sentiment escalated, Kosovar Albanian public servants were removed from their posts, and a repressive society resulted for the next decade (Kubo, 2010). Kosovar Albanians set up parallel systems such as education, medical care and a shadow government, but were effectively cut off from the outside world.

When the international community brokered the Dayton peace talks to stop the violence which had broken out throughout Balkan region in the 1990s the issues in Kosovo were not addressed. This led to frustration amongst Kosovan Albanians that the non-violent resistance was not leading to change. During this time the Kosovan Liberation Army (KLA) emerged. Opportunity arose to acquire previously unavailable arms from neighbouring Albania in 1997. This was due to the collapse of the Albanian government following the collapse of a pyramid investment scheme. This led to chaos, and vast quantities of looted arms and ammunition became available (Kubo, 2010).

The conflict between ethnic Albanians and Serbs escalated in 1998-1999. An estimated 1 million people were ethnically cleansed and displaced from the region within a few weeks in 1999 (UNHCR, 1999). Many people became the victims of genocide. Mass graves have been discovered, and thousands of people are officially missing, the International Committee of the Red Cross (ICRC) reported in 2014 that over 1,600 people were missing (ICRC, 2014). The North Atlantic Treaty Organisation (NATO) led a military campaign in March 1999 to drive Serbian forces from the region and end the conflict. The conflict officially ended in June 2000. Kosovo was placed under UN administration. The KLA were disbanded, but many of them were retrained as the Kosovo Protection Corps (KPC) (UNMIK, 2009). Following the collapse of negotiations between Belgrade and the largely pro Kosovan Albanian civil administration in Pristina in late 2007, Kosovo declared independence in 2008, with a new constitution coming into force on 15 June 2008. As of 2015, there is still a strong UN presence in Kosovo.

2.4 Post-conflict Society

The environment in Kosovo in the immediate aftermath of conflict found people striving to escape the horror of war and to rebuild a sense of normality. The region was in severe economic and political turmoil. Cardozo et al. (2000) conducted a study in early post war Kosovo, which found that 25 percent of the adult population over the age of 15 showed signs of post-traumatic stress, and rising levels of anxiety and depression. Research by Farran et. al. (1995) has shown that hope is an essential element in coping

with adverse events. Opposites of hope are hopelessness, helplessness, despair and depression. In extreme circumstances, for example mass social inequalities, the aftermath of war or genocide, entire societies may struggle with a deep sense of a loss of hope. Frankl (2004) found that a human trait is to survive by looking to the future. He termed the need to have something or someone to live for as "the self-transcendence of human existence" (Frankl, 2004:115). This encompassed the idea that if a person, regardless of the extreme circumstances they are exposed to, can find hope in finding a meaning to their existence: either a task to fulfil or a person other than themselves to care for. Schirch (2005) found that while conflict may bring about a loss of hope, ritual and the symbols involved can give an individual or a society a means to understanding the conflict, and a way to create new symbols to express new hopes for the future.

2.5 Technology Adoption

Research has focused on how to minimise the risk of failure and ensure acceptance of the system (Addison and Vallabh 2002). There are two approaches which dominate the literature, Davis's Technology Adoption Model (TAM) and Institutional Theory.

2.5.1 Technology Adoption Model

Davis (1989) developed TAM, a widely used scale of user acceptance which focuses upon technology-features which influence the adoption or otherwise of a technology. TAM is organised according to factors which affect the perceived usefulness of the technology or factors influencing the perceived ease of use of the technology.

Perceived Usefulness is defined by Davis as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989:320). This is positive for the end user as improved job performance can lead to rewards such as promotion, bonuses and salary increases (Vroom, 1964). Perceived Ease of Use relates to the degree to which a person believes that using a particular system would be free of effort (Davis, 1989:320). If a system is perceived as being easy to use it is more likely to be accepted by the end user.

2.5.2 Institutional Theory

Rather than focus upon technological features as seen by individuals, institutional theory emphasises social relations between communities of adopters. An institution is a community in which various structures and systems, which are considered legitimate by its members, provide social order and norms for cooperation within the institution and between institutions. These systems regulate the behaviour of community members and help to organise the community (Scott, 2001; Selznick 1996).

Individuals bring various commitments to the organization that restrict rational decision-making. Organizational procedures become valued as ends in themselves. Institutional commitments develop over time as the organization confronts external pressures from its environment as well as changes in the composition of its personnel, their interests, and their informal relations (Scott, 1987). When an institution is going through an innovation adoption process the deciding factor will be how the innovation will improve the internal process of the social group. Once the innovation practice has been adopted by the formal structure of the social group, other members of the group will adopt. This process insures the legitimacy of the innovation and that the social group is acting in a collective manner in line with what is valued in the community.

Prior research shows that post-conflict countries are a particular case apart from both developed countries and less developed countries. Factors related to the post-conflict context load additional complexity onto information systems development initiatives in those regions (Stapleton 2011; Feng, 2006). Neither TAM nor Institutional Theory account for the role of conflict in advanced technology, especially the symbolic aspect of technology proliferation.

2.6 Symbolism and Technology Development

Symbols are words, objects, actions, activities, events, relationships or gestures which express and uphold a set of attitudes and beliefs (Hirschheim & Newman, 1991; Morgan et. al, 1983; Schirch, 2005; Turner, 1967).

Symbols and symbolic thought are intrinsically linked to human culture and development. It is believed that modern humans were present in Africa around 170,000 years ago. The first symbolic artefacts can be traced back no further than 100,000 years ago (Mithen, 1998), while ritual in burial practice can be traced back to 320,000 years ago (Tacon, 2009). There is evidence of a dramatic population expansion and subsequent material culture explosion some 50,000 years ago (McBrearty and Brooks, 2000) and this is reflected in the archaeological finds. Art and religion are both considered integral parts of the development of modern humans and culture. These make symbolic meanings through graphical representations and liturgies.

Geertz (1966) defined religion as a set of symbols to establish powerful, pervasive and long lasting moods and motivations in men by formulating concepts of a general order of existence. Early artefacts include paintings in caves of mythical beings and ritualistic behaviour (Donald, 2009; Mithen, 2009). This allowed early humans to extend their thoughts beyond their own minds, using symbols to store and communicate (Donald, 1998; Mithen, 2009).

Henshilwood and Marean (2003) define fully modern behaviour as behaviour that is mediated by socially constructed patterns of symbolic thinking, actions and communication that allow for material and information exchange and cultural continuity between and across generations and contemporaneous communities. The development of modern humans is believed to have been assisted by symbol and

symbolic thought. Symbols do not simply store information, they themselves are part of forming beliefs and assisting in the evolution of thought and culture. A society could construct culture through symbols these symbols could then change their attitudes, beliefs and social processes. The symbols and the culture and values they represent become informative of each other. (Mithen, 2009; Hinde, 1998; Rawson, 1998).

One particular symbol is a metaphor, a trope defined as a figure of speech and thought that twists the conventional meaning of words (Gibbs, 1993; Manning 1979). Lakoff and Johnson (1980) develop this definition further by arguing that metaphor is so ingrained in human language and human life that it is a fundamental part of the human thought process. In situations where there is ambiguity or uncertainty, metaphors are useful in that they carry meaning from a situation which is understood to new situation, yet to be understood. The metaphor gives a shape and structure to a new reality. (Frost and Morgan, 1983; Schultze and Orlikowski, 2001).

2.6.1 Symbolism in Technological Development and Deployment

Information systems development (ISD) is a deeply symbolic process. According to Hirschheim & Newman (1991) by observing behaviours of participants, and interpreting information gathered through case study, it becomes possible to use symbolism to describe and explain participant behaviour when faced with difficulty or uncertainty in the ISD process. By exploring three symbols: myth, metaphor and magic (magic being superstition/religion/rituals) it was found that symbolism was a means of simplifying complicated situations and offered participants a means of becoming accepted members of a team. Kaarst-Brown and Robey (1999) used Hirschheim and Newmans' (1991) metaphor of magic to understand the management of Information Technology, and the influence of underlying assumptions. This study generated five archetypes of IT culture: the revered, controlled, demystified, integrated and fearful. They postulated that "organisations do not necessarily develop unified symbolic meanings of IT" (Kaarst-Brown and Robey, 1999:192).

It is noted by Tinker (1986) that metaphors do not provide a neutral basis for expressing understanding of a phenomenon, that metaphors can not only enable, but also constrain how humans interpret and act in their environment (Tinker, 1986, Schultze and Orlikowski, 2001). Kendall and Kendall (1994) observed metaphors used in information systems, 6 of these metaphors: journey, game, war, machine, organism and society, are previously presented by Clancy (1989) and a further 3 observed in their own work, family, jungle and zoo:

Journey: typically takes the form of a captain leading a crew on a voyage.

Game: Reaching a goal, difficulty reaching the goal, risks along the way, teamwork is key.

War: Goal is paramount, the leader is detached from the foot soldiers. Rules are clearly defined and adhered to. Command comes from top down.

Machine: uniformity over creativity, human actors seen as replaceable parts.

Organism: opposite of machine metaphor, a balance between order and chaos.

Society: focus on alternatives, not one goal. Members pursue their own goals, within an organised set of rules.

Family: members compete to achieve their goals, this is balanced by a head who makes the decisions. There is a sense of comfort and membership.

Zoo: sense of chaos, people put together to fulfil organisations need, may not be truly united.

Jungle: chaotic, unpredictable, every man for himself, no common purpose, people reduced to basic survival instincts.

Hirschheim & Newman (1991) observed similar metaphors, information systems as a battle, organisations as fiefdoms, and man as a machine. Metaphors may have a positive or negative impact on success in information systems development. Hirschheim & Newman (1991) also found that there were possible negative aspects to the symbols employed by participants, where symbolic meaning resulted in unsuitable responses to specific or unique situations, or prompted participants to interact negatively with end users.

Oakes and Fitzgerald (2007) used a deductive approach to exploring metaphors in IS research, they took metaphors and mapped them to selected organisations. Their findings suggested that this approach helped developers understand organisations during a project, enabling the developer to adapt the process or product to that organisation.

2.6.2 Symbolism in Post-conflict Regions

Symbolic politics theory describes ethnic wars as being driven by prevalent, aggressive emotions toward another group, and the use of ethnic symbols by political and social leaders to direct these emotions (Edelman, 1971; Kaufmann, 2006). Religion and the role it plays in defining the ethnic identity of a group has been emphasised in wars and ethnic conflicts (Mead, 1967). When symbols are used as validation for conflict, then the re addressing of these factors can be part of the conflict resolution, and the rebuilding of a society in the aftermath (Kaufmann, 2006; Schirch, 2005). Thus when a region is experiencing huge social and political upheavals, such as an ethnic war and its aftermath, symbols can drive social change, reduce ambiguity and uncertainty, and assist an individual and a social group to create a new reality though new symbols (Smith, 1973; Bolman and Deal, 1997).

2.6.3 Symbols of Hope in Post-conflict Regions

There are many varying definitions and descriptions of hope in psychology, medical, social and anthropology research. Lazarus (1999) defined hope as "to believe that something positive, which does not presently apply to one's life, could still materialize, and so we yearn for it" (Lazarus, 1999:653). Lazarus goes on to describe hope as "a mixed state of mind" which incorporates unease about present circumstances and how these affect the future Lazarus (1999: 665).

Snyder (2002) described the Lazarus definition of hope as a "repair category", and in all lists three categories of hope:

Repair: Where the only appropriate goals are those that fill a profound void in a persons' life.

Goal-Directed: Goal directed thoughts or maintenance goals that comprise of daily agendas in living.

Enhancement: Building on what is already satisfactory- to reach for grand goals that have enticed people throughout history

(Snyder 2002:250)

Snyder defines hope as "the perceived capability to derive pathways to desired goals, and motivate oneself via agency thinking to use those pathways" (Snyder, 2002:249). Bronfenbrenner's theory of human development, the bio-ecological theory (1979) mentions hope as a subjective element of experience, an emotion similar to despair, anger or love, that influences a persons' interactions, and can vary according to life events and experiences.

Yohani (2008), found that hope could be built using methods combined with human ecology theory

1) hope is contextualised, embedded in personal experience and life contexts.

2) hope is nurtured in reciprocal relationships.

3) the dynamics of hope involve personal appraisal actions

The next section discusses the methodology used to explore the concepts set out in this chapter.

3. METHODOLOGY

This chapter gives an overview of the grounded theory methodology employed in this study. The topics covered are grounded theory, the single case study, interview types and selecting the case study. An overview of the case, Telemedicine Centre Kosovo is also included. The final two sections detail how the data was gathered and processed.

3.1 Introduction to Qualitative Research

Qualitative Research methods were originally developed in Social Sciences to facilitate the study of social and cultural phenomena (Myers, 1997). Examples of the most common methods of qualitative research include action research, case study and ethnography. Data sources include participation in the setting (field work), direct observation, interviewing, analysing documents and material culture (Marshall and Rossman, 1999).

3.2 Grounded Theory

Grounded theory and the single case study research approach are well established research approaches in Information Systems research (Matavire and Brown, 2008) Grounded theory is the generation of theory from data obtained during a study, this data can be obtained through interview, questionnaire, observation, documentation, images etc. The researcher simply goes into their chosen field and collects data (Robson, 2002; Glaser and Strauss, 1967; Strauss and Corbin, 1998). According to (Robson, 2002) the researcher makes a series of visits to the field, until analysis of the data has reached a point where no new information from the data is possible. Interview is the most common method used in the grounded theory approach; however Strauss and Corbin (1998) dictate that grounded theory can be carried out using quantitative or qualitative methods.

The research process was carried out in distinct phases, as set out by Walsham (2006): Identification of the case organisation, one set of open interviews, analysis of the open interviews, a set of semi-structured interviews, analysis of the semi-structured interviews, and theory building (Figure 2).
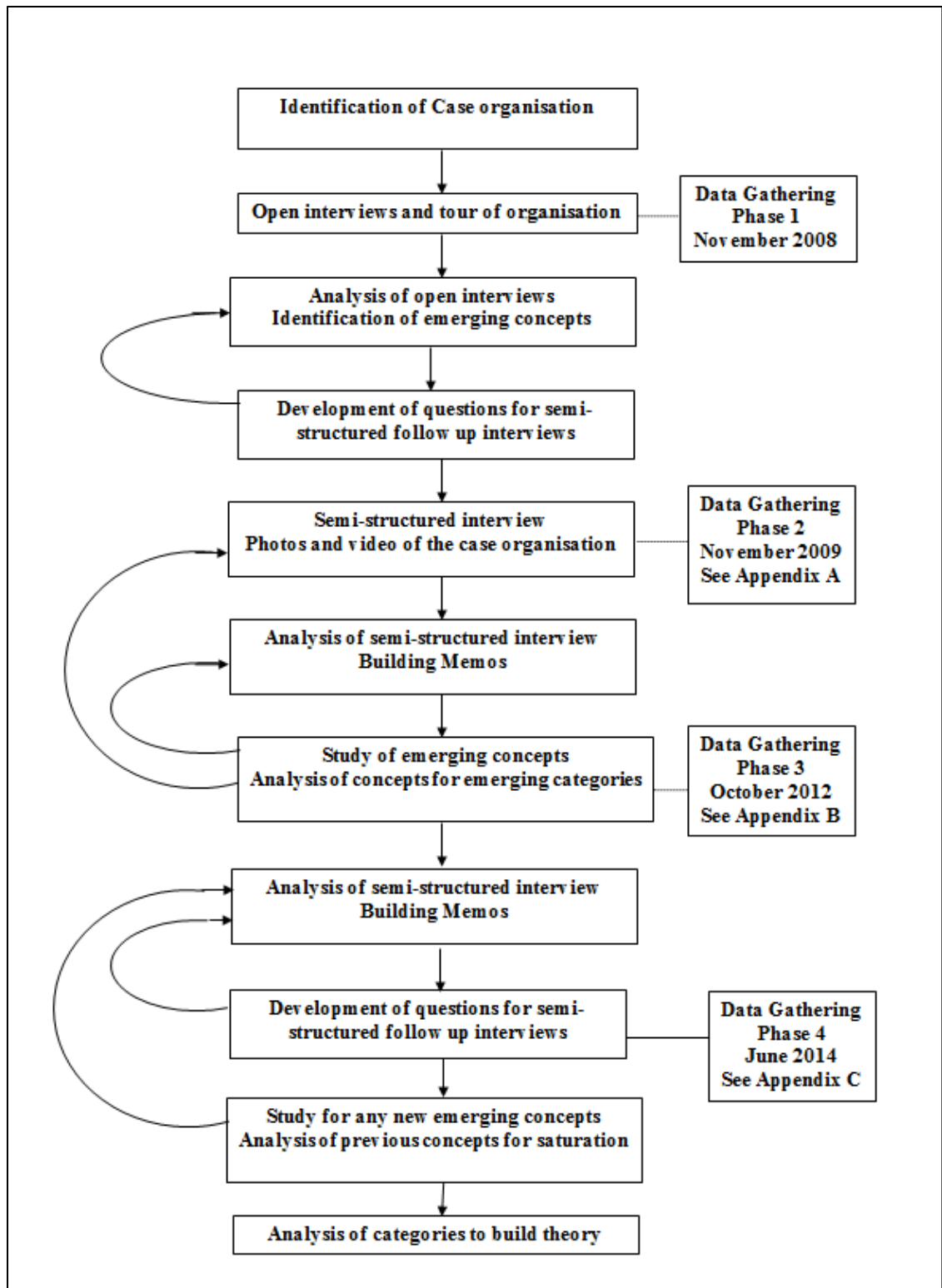
Figure 2 Data Gathering and Analysis

3.2.1 Data Analysis in Grounded Theory Studies:

There are three sets of coding (these do not have to be sequential - they can overlap):

1. **Open Coding**

   The researcher forms initial categories of information from the data. Within these categories the researcher looks for subcategories (properties), and then for the data to "dimensionalise" (show the dimensions on which the properties vary)

2. **Axial Coding**

   This is where the data is assembled in new ways after the open coding. A Logic Diagram (Coding Paradigm) is developed. This Logic Diagram does the following:

   - Identifies a central phenomenon
   - Explores causal conditions (conditions that influence the phenomenon)
   - Specifies strategies (actions and interactions that result from the central phenomenon)
   - Identifies context and intervening conditions (conditions that influence the strategies)
   - Delineates the consequences (outcomes of the strategies)

3. **Selective Coding**

   This is the integration of the categories in the axial coding section. This is where conditions propositions or hypotheses are constructed.

   (Adapted from Robson, 2002:194)

3.3 Single Case Study

A single case study was selected as the method of studying this socio-technical project. According to Yin (2009) the case study is an empirical inquiry that explores a "contemporary phenomenon in depth and within its real life context" (Yin, 2009:18). The case study allows the researcher to document the key people in the project and the

interactions between them. It describes a situation as it unfolds, or can allow the researcher to investigate the key issues and events that shaped a project (Simons, 2009) The case study allows the researcher to answer the "how" and "why" questions (Yin, 2009).

3.4 Interview

Interviewing can be structured, semi-structured or unstructured (Fontana & Frey, 1994). The unstructured interview gives a great depth of information. It does not impose any prior categorisation that may limit the data being sought (Fontana & Frey, 1994). It is an informal conversation, and is therefore flexible and multi directional. This type of interview can change according to the flow of the data being obtained, and whatever information emerges (Patton, 2002).

The structured interview is where an interviewer asks each respondent a series of pre written questions with predefined responses. This method provides little if any flexibility. (Fontana & Frey, 1994). This method allows for comparisons to be made, as each respondent is asked the same questions. It also helps to reduce interviewer bias (Patton, 2002).

The semi structured approach is a combination of the two approaches, which can achieve broader and better results (Fontana & Frey, 1994). A common semi structured approach involves using a standardised interview format in the early part of the interview, and an unstructured approach in the later part of the interview, or combining both during the interview (Patton, 2002).

According to Myers (1994:198) "only a rich, integrative view of IS implementation does justice to the complex realities of social life in organisation". Harvey and Myers (1995) argue understanding specific concepts can have more relevance and meaning than knowledge that is generalisable.

3.5 Selecting the Case

Initial contact was made with the award winning Telemedicine Centre of Kosovo (TCK) in 2008. In order for a case organisation to meet the requirements of the study it needed to satisfy the following three important criteria:

1.   The initiative had to be primarily directed towards provision of services in a post-conflict region

2.   The initiative was successful: Two further criteria were assessed: The initiative had to have

   a)   been sustainable over a period of greater than three years
   b)   achieved an international reputation as a centre of excellence.

3.   The project was sufficiently complex i.e. involved more than one site, more than one organisational group and more than one functional domain

Criteria 2 and 3 were adapted from criteria adopted in previous studies to select complex IT deployment case studies (Stapleton (2001A) & (2001B)) and the first criterion was selected as a fundamental prerequisite for research on post-conflict regions.

3.6 Kosovo – A Case of a Post-conflict Region

Kosovo was a primary case of a post-conflict region having been involved in a serious conflict into which the international community had been drawn. A model adapted from Ellingsen (2000:239) sets out the variables that, when present, can impact on society and lead to regional conflict (Figure 14). All of these variables were present in the lead up to the conflict in Kosovo, this is described in more detail in the following section.
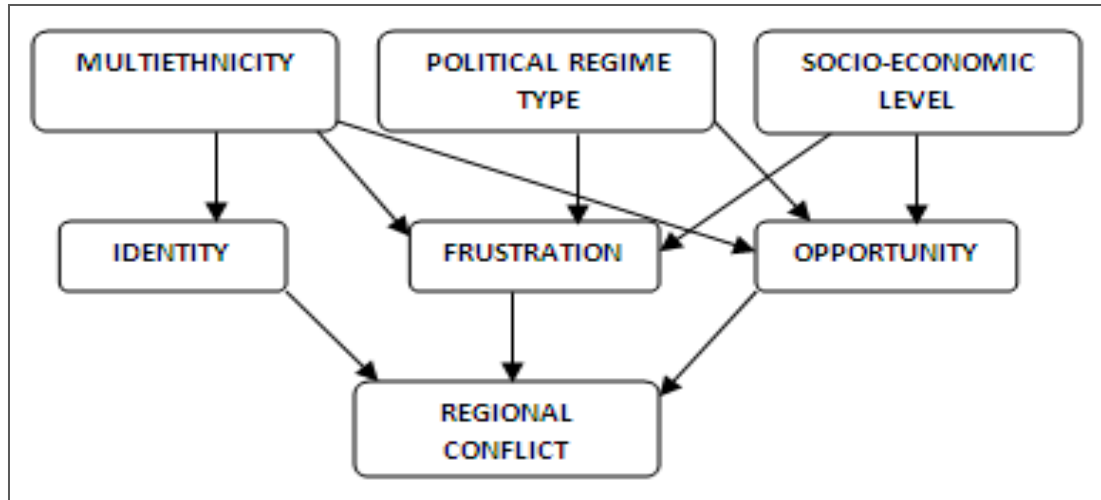
Figure 3 Regional Conflict Model (adapted from Ellingsen, 2000:239)

3.6.1 Kosovo Through the Regional Conflict Model Lens

The symbolic importance of Kosovo as an integral part of the Serbian identity dates back to the Battle of Kosovo in 1389, where the Serbian forces were beaten by Turkish forces, on a battle field which lies just north of the Kosovo capital Pristina (*Multi-ethnicity. Identity*) Throughout the centuries which followed, Kosovo came under Serbian rule, the Ottoman Empire, and later became part of the new state of Yugoslavia after World War I (Wilson, 2009). Kosovo retained a high level of autonomy up to the late 1980's, with 90% of its population ethnic Albanian (Ron, 2001; Wilson, 2009). In 1989-1990 the political regime type changed, and the rise of Serbian nationalism resulted in the abolition of Kosovan autonomy. *(Political regime type, Identity)* This era was marked by a celebration of the 600th anniversary of the Battle of Kosovo, during which the Serbian leader Slobodan Milosovic made a speech at the Gazimestan monument on the battlefield to rally Serbian nationalist feeling (*Opportunity. Identity. Frustration.*). Anti-ethnic Albanian sentiment escalated, Albanian public servants were removed from their posts, and a repressive society resulted for the next decade (Kubo, 2010) *(Political regime type. Socio-economic level.)* Albanians set up their own systems such as education, medical care and a shadow government, but were effectively cut off from the outside world. *(Socio-economic level. Frustration)*

When the international community brokered the Dayton peace talks to stop the violence which had broken out throughout Balkan region in the 1990s the issues in Kosovo were not addressed. This led to frustration that the peaceful resistance was not leading to change. *(Frustration)* During this time the Kosovan Liberation Army (KLA) emerged. Opportunity arose to acquire previously unavailable arms from neighbouring Albania in 1997. This was due to the collapse of the Albanian government following the collapse of a pyramid investment scheme. This led to chaos, and vast quantities of looted arms and ammunition became available (Kubo, 2010). *(Political regime type. Opportunity)*

The conflict between ethnic Albanians and Serbs escalated in 1998-1999. An estimated 1 million people were ethnically cleansed from the region within a few weeks in 1999. Many Serbs and Albanians became the victims of genocide. Mass graves have been discovered, and thousands of people are officially missing. NATO led a military campaign in March 1999 to drive Serbian forces from the region and end the conflict. The conflict officially ended in June 2000. Kosovo was placed under UN administration. The KLA were disbanded, and many of the soldiers were retrained as the Kosovo Protection Corps (KPC). Kosovo declared independence in 2008, with a new constitution coming into force on 15 June 2008, however its status is still disputed.

3.7 Case of Successful, Complex Information Technology Initiative in a Post-conflict Region

Any project located in Kosovo and designed to service users in the Kosovo region would therefore meet the first criterion. Initial contacts with TCK and independent background searches revealed that the TCK had been internationally and independently recognised as a successful project which could act as an exemplar for similar interventions in other regions. TCK's international reputation was reinforced by its inclusion in one of the earliest international telemedicine institutional directories co-sponsored by the World Health Organisation (TMEHD (2005)), and it was one of only two organisations in less developed countries (LDCs) referenced in that document. In 2004 a key international partner of TCK, The University of Arizona College of

Medicine, described TCK as the hub of an emerging Telemedicine Centre of Excellence in the Balkans (Latifi (2004)). By November 2009 the International Virtual e-Hospital Foundation and the Department of Surgery at the University of Arizona announced that TCK had received an award from the United States Agency for International Development (USAID) to establish Albania's first National Telemedicine Centre, expanding the TCK initiative to a Balkan, rather than Kosovan, role. In 2010 TCK and its partners were actively seeking to roll out the TCK initiative in Macedonia and Montenegro (Latifi, 2010). This demonstrated that this project was an exemplar of telemedicine service provision internationally, had been sustainable over a considerable period and was working to provide services into post-war Kosovo. At the time the study began TCK had been in place 9 years. TCK provided a wide variety of clinical and educational services. TCK had implemented central and field services in Pristina, Gjakova and Peja in the Kosovan territory and had won a contract to implement these services in neighbouring Albania.

In short, TCK was an ideal initiative for the purposes of this research investigation. TCK were approached and initial meetings were set up during which TCK agreed to participate in the study.

3.8 Overview of TCK

TCK was a means of providing basic medical care and medical education to a region which was severely under resourced. Due to the 1999 conflict and the instability of the region many basic infrastructural, medical and educational services had been adversely affected. Most hospitals were difficult to access, due to poor physical infrastructure. Interviewees reported that patients were reluctant to make a journey to the main hospital in Pristina, with the fear that a long journey on poor roads could exacerbate their condition or injury. Interviewees explained how regional medics were often not fully aware of medical problems suffered by a patient. One major reason reported for this was that printed medical literature was typically out of date for many years. Also, interviewees told how many Kosovan doctors were excluded from medical education

and practice during the 1990s on ethnic grounds. Consequently, they had received little or no surgical or in-hospital experience during their training.

Telemedicine can help to overcome these issues. As a result of the TCK ISD project, patients can be examined in a virtual consultation, without the need to travel. These telecommunication facilities allowed doctors in a field hospital to consult with doctors in Pristina about a specific case, send documentation, process images and share findings. The international medical community could also be consulted: doctors now attended video conferences, seminars and workshops, with lectures provided by foreign doctors to add to their training. TCK had set up a facility to view live surgery from operating theatres in Europe, the US and South America. The latest medical journals and books had been made available online through the e-library thus supporting ongoing training and retraining programmes.

3.8.1 Overview Of Information Technology At TCK

In Pristina the finished system consisted of a server room with multi-conferencing capability for up to 25 users and a grade 5 level server with 1.5 Terabytes capacity, and a 10 MB/sec dedicated link. Telemedicine facilities in the regional hospitals were connected through a 512 (Kbps) link. The teleconferencing room was complete with all of the facilities needed to teleconference to other centres located around Kosovo, Europe and the U.S., such as the Polycom VSX7000 view station for point-to-point and multipoint communications via a Polycom MGC-25 Multiconferencing Unit (Polycom, 2010). Teleconferencing sessions were streamed live online, and recorded for later use, using a Polycom RSS2000 Recording and Streaming Unit. The telemedicine room had also been constructed which consisted of a telemedicine unit called "Medvizer". This system had a vital signs monitor, could measure blood pressure, and included support for many peripheral devices, all accessible through med visor software, including a camera for documents that could be circulated in real time. It featured camera equipment and computer monitor, which provided a link to other hospitals/surgeries to create a "virtual" consultation facility. This also connected to the emergency room

located on the ground floor of the University Clinical Centre. There was an e-Library and a lecture theatre consisting of an additional auditorium, for ongoing education and training. All the above facilities were successfully installed by the local TCK team, and fully operational. These systems in Pristina were linked to the systems in other centres which span the entire region: Mitrovica, Peja, Prizren, Gjilan, Gjakova and a Main Family Centre in Skenderaj.

These systems represented some of the most advanced systems in the Balkans. Indeed TCK utilised technologies which were uncommon even in the developed west at the time of installation, and was comparable to some of the leading telemedicine developments found in the US and Europe, the company providing the "Medvizer" technology, ViTel Net, were the leading research partner with the US government in their field (ViTel, 2011).

3.9 Data Gathering

The first visit to the telemed centre consisted of a tour of the facilities, and open interviews with the 2 members of the IT team and doctors on site. Visit 1 is summarised in Table 1. The team explained the issues that arose at the beginning of the project, and while the original systems were built: the emergency centre building which is the base of the system in Pristina was a shell, and needed to be rebuilt (6 truck load of dead pigeons needed to be removed).The roof of the building was rebuilt by British troops. The IT team had to lay cables themselves, at one point risking their own safety to link cables across roofs without safety harnesses. The visit also provided the opportunity to observe the location and surrounds of the telemedical centre, as well as insights into the environment where the telemedical centre was based.

A semi-structured interview protocol was then developed for visit two based on analysed data gathered in the first set of interviews (Appendix A). This provided a basis for the second set of interviews in visit two. Visit 2 is summarised in Table 1. Four key

players participated in the second set of interviews, the executive director, the IT manager, an e-librarian and trainee doctor in the Pristina centre, and a lead doctor from the hospital in the city of Gjakova. The executive director and IT manager were interviewed together, in the executive director office at TCK. The IT manager was then interviewed alone, in the director office, and during a follow-up tour of the facilities. Following this interview the e-librarian was interviewed in his office beside the e-library. The interview with the doctor took place in the facility in the city of Gjakova. This interview was conducted in the telemedicine room in Gjakova, and a tour of the facilities in Gjakova followed. The facilities consisted of the telemedicine room, and a conferencing room complete with teleconferencing equipment.

Photograph and video data was also collected during the second visit. In Pristina photographs were taken of the surrounds of the telemed centre, the hospital in the floors below and the centre itself. Similar locations were also recorded in the centre in Gjakova. Video footage was recorded in the main hospital and in the stairwell of the hospital leading into the telemedicine centre. In all over 100 photographs were taken and 12 short video clips captured. Documentation was also collected.

A second set of semi-structured interviews (Appendix B) were drafted for the third visit. Visit 3 is summarised in Table 1. The participants of the third set of interviews were the previous participants, with the addition of two new participants: a female co-ordinator and another IT worker. The interviews took place in TCK, with the director and co-ordinator together in the director office. The co-ordinator was then interviewed alone. The e-librarian was interviewed in his office attached to the e-library. The IT worker was interviewed in his office, and during a detailed tour of the facilities over two separate days. The doctor in Gjakova was interviewed in a café close to the hospital in Gjakova. This visit to Gjakova also allowed a revisit to the facilities there. Photographs were taken at each location.

The third visit also allowed the researcher to explore the responses of the participants to previous findings and drafted papers, and to review their interview data.

The third set of semi-structured interviews, (Appendix C), was drafted to confirm the findings and reach saturation. These interview questions were then used in Visit 4. Visit 4 is summarised in Table 1. The participants of those interviews were the previous visits, excluding the female co-ordinator, who had left her role. 2 new participants were also included, a female medic, who was interviewed alongside the female doctor in Gjakova, and a female medical student who was also a telemed assistant. Photographs were again taken at each location.

The fourth visit also allowed the researcher to explore the responses of the participants to previous findings and drafted papers, and to review their interview data.

This cycle of the researcher reporting to the case study organisation, obtaining feedback and revising data as the basis of this feedback is similar to the approach adopted in Action Research, and the action research cycle (Kemmis and Wilkinson, 1998)[1].

Telemedicine involved the delivery of ICT enabled solutions across different geographical locations. The study also moved around different locations, from the central site in the capital Pristina, to field sites where TCK had implemented telemedical facilities such as Gjakova and Mitrovica.

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[1] Action Research usually has a purpose of influencing a change in the organisation focused on. According to Robson (2002:215) "Improvement and involvement are central to action research". The action research cycle is a cyclical process where a change is enacted, observed, reflected on, and the results leading to further action and the process is repeated (Kemmis and Wilkinson 1998).

Visit	Date	Activities
1	November 2008	Tour of facilities in TCK Pristina
		Interviews in TCK Pristina
Interaction to verify findings/data verification		
2	November 2009	Tour of facilities in TCK Pristina
		Interviews with variety of personnel at TCK Pristina
		Tour of facilities in Gjakova
		Interviews with personnel in Gjakova
Interaction to verify findings/data verification		
3	October 2012	Tour of facilities in TCK Pristina
		Interviews with variety of personnel at TCK Pristina
		Visit to Gazimestan Monument
		Visit to Serbian enclave and monastery of Gračanica
		Tour of facilities in Gjakova
		Interviews with personnel in Gjakova
Interaction to verify findings/data verification		
4	June 2014	Tour of facilities in TCK Pristina
		Interviews with variety of personnel at TCK Pristina
		Tour of facilities in Gjakova
		Interviews with personnel in Gjakova
		Visit to city of Mitrovica

Table 1: Visits Overview

The data from these interviews has had some exploratory analyses, consisting of reading, memo writing and draft paper writing (Appendix D, E, F, G, H, I, J)

3.10 Data Processing

The open interviews conducted in the first visit to the telemedical centre were analysed and coded, in the immediate aftermath of the interviews, and later revisited. The initial phase in grounded theory, as specified by Corbin and Strauss (2008) is open coding. The interview transcripts were broken into manageable segments according to subject, themes or natural breaks in the conversation. Each segment was referred to as a memo. The words, themes, phrases in these memos were each analysed for concepts. A series of semi-structured interview questions for the second visit were then drafted (Appendix A) which explored these concepts in more depth, with the aim of building categories of concepts which had commonalities. This process is described by Glaser and Strauss (1967) as "constant comparison".

Subsequent to the second visit the data was read and analysed, to allow the researcher to explore the concepts, both comparing similar concepts found in the first set of open interviews, and to find new and emerging concepts. Extensive analysis was carried out, consisting of thinking, reading, presenting working data to peers, diagrams and draft paper writing. The researcher then revisited the concepts that emerged from this analysis to find links between them or commonalities, referred to as categories (Corbin and Strauss, 2008). The semi-structured interview questions for visit 3 were then drafted (Appendix B), to explore these links and to bring the data closer to saturation point. These categories reduces the number of concepts to be analysed, and provided a basis for emerging themes and, eventually, for building theory. The result of this stage of the study was the drafting of the semi-structured interview questions for visit 4 (Appendix C), the final visit. These interview questions were drafted to confirm the previously emerging themes, confirm the theory emerging and bring the study to saturation.

The next chapter sets out the research papers and book chapter which were produced from the analysis of the interviews and data gathering, and theory which emerged from the research.

4. SUMMARY OF PUBLICATIONS

This chapter sets out the publications which form the main outcomes of this study. The publications are presented in full in Appendices D-J. Publications D, F, G and I are publications from conferences. Publications E and J are from journals. Publication H is a book chapter.

This chapter is broken down into seven sections, one section for each publication. Each publication is summarised under the headings: Research objectives and methods, results, and relation to the whole. The first publication gives an overview of the initial stages of the study. The second publication presented major findings of symbolism and hope. The third publication presented findings of role of symbols of conflict. The fourth publication was an initial overview of Ciborras (2002) theory of hospitality. The fifth publication was an in-depth exploration of Ciborras theory of hospitality. The sixth publication was an overview of the observations of changes made during the study, in relation to Lunds' (1996) Curve of Conflict. The seventh publication was an in-depth exploration of the local and international politics at play in the region.

4.1 Publication 1: Systems Development and Key Success Factors in Large Scale Telemed Projects: Preliminary Findings of a Post-Conflict Country Case Study.

Kealy, A. and Stapleton, L. (2010) Systems Development and Key Success Factors in Large Scale Telemed Projects: Preliminary Findings of a Post-Conflict Country Case Study. in Kopacek, P. & Hadjrizi, E. (eds)., *Procs of the IFAC Conf in International Stability and Technology (SWIIS), Pristina: Kosovo 2010*: Holland: Elsevier. (Appendix D).

4.1.1 Research objectives and methods

The first publication from this research was an overview of the preliminary stages of the study into the success factors of large scale telemedicine projects in a post-conflict setting. The paper presented data analysis from the first two visits to the telemedicine centre. These visits consisted of an open interview and a follow-up semi-structured interview. The focus of the paper was to explore the 7 categories which had emerged from the initial analysis of the data. As the research method was grounded theory, a set of working research questions were used. These working research questions provided a means of structuring the data, giving meaning to the initial stages of analysis.

The initial 7 categories were: 1) conflict, 2) telemedicine centre as an object, 3) external influences, 4) local politics, 5) motivation for telemedicine workers, 6) motivation for doctors, and 7) leadership. The working research questions focused on how the post-conflict setting impacted technology adoption and implementation, both for medical staff and for the IT team implementing the project.

4.1.2 Results

The results showed that many of the categories which had emerged from the initial data analysis and coding were consistent with findings in current literature. The post-conflict setting was evident as an influencing factor for the medical staff and the IT team implementing the projects who were interviewed. The conflict, external influences,

local politics, and motivation categories were supported by the findings of Shields and Servaes (1989) who stated that when IT systems for developed regions are brought into developing countries, the attitudes, and social and political structures of the developed regions can also be transferred. What also emerged from this exploratory analysis of the initial findings was the gap in technology adoption theories in relation to post-conflict regions.

4.1.3 Relation to the whole

This paper provided a solid base from which to continue the analysis and data gathering needed to reach the saturation point required in a grounded theory study. The need for more data gathering to explore the categories of conflict, external influences, local politics, and motivation further was clearly evident. The category of leadership was de-emphasised as the research moved forward, as further interviews did not bring any new data on this category. As the symbolic nature of the centre was explored in more detail in later work, the leadership category became part of the symbolism theory.

The external influences and local politics categories were subsequently explored further and contributed to the eventual synthesis of the politics/institutional spiral of the spiral model (Section 5.4). Motivation, leadership and conflict categories contributed to the eventual synthesis of the symbols/hope/conflict spiral (Section 5.4).

4.2 Publication 2: Symbols of Hope: A Case Study of Telemedicine Projects in Post-conflict Regions.

Kealy, A and Stapleton, L (2012) Symbols of Hope: A Case Study of Telemedicine Projects in Post-conflict Regions. *Journal of Information Technology Case and Application Research (JITCAR)* 14 (3). (Appendix E).

4.2.1 Research objectives and methods

The second publication from this research was an in-depth exploration of the categories 1) telemedicine centre as an object, 2) motivation for telemedicine workers, 3) motivation for doctors and 4) leadership. Further analysis of these categories produced evidence that the success of the centre was driven by hope symbolism. The publication formed one of the most important contributions to the research, the impact of hope and symbolism. These insights had not received much attention in the literature previously. The paper presented data analysis from the first three visits to the telemedicine centre. These visits consisted of an open interview and two of the follow-up semi-structured interviews. The second semi-structured interview aimed to confirm the concepts of hope and symbolism.

4.2.2 Results

There was evidence at TCK that symbolic meaning and hope were important success factors in ICT development. There was also evidence that the interviewees personal trajectories and the successful progress of the project were linked. The findings were also consistent with Snyders (2002) categories of hope: repair, goal direction and enhancement, and Yohani's (2008) theory that hope can be built using methods combined with human ecology theory. The results also clearly indicated that that the technology was more than a technical artefact, it provided a setting for symbolic thought and action.

The results were broken down into sections covering the main centre in Pristina, and the centre in the city of Gjakova. These sections were: Surrounding symbols of conflict and aftermath of the conflict, spatial characteristics of TCK, and language and symbol in

TCK, which included three subsections: conflict and U.S. influence, motivation levels and drivers, and change and revolution.

4.2.3 Relation to the whole

Work on this publication provided an in-depth analysis of the categories of 1) telemedicine centre as an object, 2) motivation for telemedicine workers, 3) motivation for doctors and 4) leadership. This work then developed of one overall category: Symbolism, and hope symbolism. These findings and conclusions suggested the study had reached saturation on these categories. Work on this publication further confirmed the importance of the categories of conflict, external influences and local politics, and how their management was inextricably linked to the overall success of TCK. Therefore these categories needed further exploration and data to reach saturation.   This publication also allowed the researcher to carry out preliminary reflections on Ciborra's theories about ICT initiatives. These conclusions led the researcher to the next phase of the research culminating in full saturation.

The hope category contributed to the eventual synthesis of the symbols/hope/conflict spiral of the spiral model (Section 5.4).

4.3 Publication 3: Telemedicine Systems Development in Post-Conflict Contexts: A Country Case Study of the Role of Symbols of Conflict in Systems Engineering

Kealy, A and Stapleton, L (2012) Telemedicine Systems Development in Post-Conflict Contexts: A Country Case Study of the Role of Symbols of Conflict in Systems Engineering in Stapleton, L. (ed). *Procs of the IFAC Conf in International Stability and Technology (SWIIS), Waterford: Ireland 2012*. Holland: Elsevier. (Appendix F).

4.3.1 Research objectives and methods

This publication was a preliminary exploration of the category of conflict, which had emerged from preliminary analysis. The Technology Adoption Model (TAM) (Davis, 1989) and Institutional theory (Scott, 2001; Selznick, 1996) were explored for evidence that conflict and symbols of conflict are addressed in implementation and adoption of technology theories. The methods used were an in depth exploration of the concepts which emerged from the first two interviews and images captured, under the headings "visible symbols of conflict" and "language symbols of conflict".

4.3.2 Results

The results indicated evidence of symbolism of conflict and that this symbolism had an impact on the implementation of the project. The importance of this on the outcome of this project was evident in the findings. The findings also showed that TAM and institutional theory had not addressed the importance of conflict and symbols of conflict in a post-conflict technology adoption process.

The results also indicated that further research and analysis of this concept was necessary to reach the saturation required in a grounded theory study.

4.3.3 Relation to the whole

This paper provided an exploratory analysis of the categories of conflict and symbolism. The importance of the impact of these concepts on TCK was evident. It also allowed the researcher to carry out preliminary reflections on the TAM and institutional theory. These preliminary findings suggested that this paper was a pivotal point in the research as a whole. It confirmed previous explorations of symbolism and

its impact on TCK. It also opened the discussion on institutional theory and what it lacked when applied to post-conflict regions. Neither TAM or institutional theory addressed the symbolic importance of conflict in post-conflict regions. However these findings and conclusions suggested the study was not close to saturation on these categories, and led the researcher to the next phase of the research to reach full saturation of the study.

The conflict category were subsequently explored further and contributed to the eventual synthesis of the symbols/hope/conflict spiral of the spiral model (Section 5.4). Institutional theory (Scott, 2001; Selznick, 1996) was also explored further and this contributed to the eventual synthesis of the politics/institutional spiral of the spiral model (Section 5.4)

4.4 Publication 4: Telemedicine Systems Adoption in Post-Conflict Contexts: A Case Study of the Role of Community through the lens of Hospitality in Systems Engineering.

Kealy, A., Stapleton, L. (2013) Telemedicine Systems Adoption in Post-Conflict Contexts: A Case Study of the Role of Community through the lens of Hospitality in Systems Engineering in Kopacek, P. & Hadjrizi, E. (eds)., *Procs of the IFAC Conf in International Stability and Technology. (SWIIS), Pristina: Kosovo 2013.* Holland: Elsevier. (Appendix G).

4.4.1 Research objectives and methods

This publication covered two objectives: 1) preliminary exploration of Ciborras' (2002) theory of hospitality and 2) the impact of communities of practice in the medical community, in the context of Ciborras theory of hospitality. The continuous medical education (CME) within the medical community lends a significant importance to community of practice (CoP) in context of telemedicine adoption. Ciborra compared the adoption of ICT to that of a host and a guest, where the ICT was the guest. By accepting the stranger/ICT a link between two separate worlds was created (Ciborra, 2002). By exploring CoP through the lens of Ciborras theory of hospitality the researcher aimed to gain an insight into the impact of CoP on the success of the centre.

The methods included a preliminary exploration of the concepts which emerged from the first three interviews and the images captured, using a camera, under the headings provided by Ciborras' hospitality theory, the effects of hosting ICT on the host:

    1) Hosting technology successfully will redefine the identity of the host.

    2) Any attempt to control the technology leads to failure.

    3) Different cultures have different codes, norms and rituals for hospitality, the technology must accept them

    4). the technology has a right to visit but not to stay (the right to say yes or no to technology)

    5). If the technology is perceived as hostile, the host will treat it as an enemy

Ciborra (2002: 113).

4.4.2 Results

The results indicated that the hosting of a new technology in a post-conflict setting demonstrated a divide in the medical community. The successful hosting of the technology was reflected in the new and emerging medical community, who embraced the technology and used it to establish a new CoP. Evidence to support the five effects of hosting the technology on the host put forth by Ciborra was visible in the longer established pre-ICT CoP and in the newer ICT supported CoP.

4.4.3 Relation to the whole

This paper provided an exploratory analysis of Ciborras theory of hospitality, in the context of CoP in the medical community during ICT adoption. It allowed the researcher to carry out preliminary explorations of Ciborras theory of hospitality in relation to the successful adoption of telemedicine. In relation to the whole study the paper is an important chapter, it confirms that the theory of hospitality is an important tool in the exploration of the success of TCK. It also provides an exploration of the medical communities reported reaction to TCK and the reported impact of TCK on that community. The conclusions of this exploration suggested that the study was not close to saturation, and that further exploration of the success factors of ICT adoption could be further explored through the lens of hospitality.

The theory of hospitality was explored further and contributed to the eventual synthesis of the host/guest spiral of the spiral model (Section 5.4).

4.5 Publication 5: Rebuilding Hope in Post-conflict Regions: Telemedicine In Kosovo.

Kealy, A. and Stapleton. L. (2015) Rebuilding Hope in Post-conflict Regions: Telemedicine In Kosovo. *In (Ed. Marion Hersh) Ethical Engineering for International Development and Environmental Stability.* Springer-Verlag: London. (Appendix H).

4.5.1 Research objectives and methods

The objective of this book chapter was to more fully explore the impact of hosting the telemedicine technology as a factor in the success of the telemedicine centre in Kosovo. This follow up to publication four formed the main contribution the researchers exploration of Ciborras' metaphor for hospitality (where the host was the organisation adopting the technology and the ICT was the guest). This metaphor was explored in the context of the success of the telemedicine centre. As grounded theory was used as the research method in this study, this book chapter was a continuation of the work carried out in publication 4: an in depth exploration of the concepts which emerged from the first three interviews and images captured, under the same five headings provided by Ciborras' hospitality theory, the effects of hosting ICT on the host.

4.5.2 Results

The results of this section of the study found that there was further evidence to support Ciborras theory of hospitality: the impact of hosting the technology on the host. The successful implementation and adoption of the technology resulted in changes to the hosts' identity, not controlling the technology allowed for the technology to be used in ways not originally intended, yet yielding positive results. The confidence built using the technology allowed the hosts to opt in or opt out of using the technology.

4.5.3 Relation to the whole

This book chapter was a major contribution to the study as a whole. It allowed the researcher to more fully explore the theory of hospitality in the context of a successful ICT implementation and adoption, and bring this section of the research to saturation.

The findings suggested that the impact of hosting the technology on the organisation can have a positive impact on the success rate of large scale technology projects in post-conflict developing regions. It also brought the concepts of motivation and hope to saturation, a requirement for the grounded theory nature of the research. The theory of hospitality was explored further and contributed to the eventual synthesis of the host/guest spiral of the spiral model (Section 5.4). This book chapter and the conclusions drawn from it led the researcher to complete the final piece of the study, the further exploration of the political environment, the local and international politics.

4.6 Progress and Change in Post-conflict Developing Regions: Observations of A Longitudinal Grounded Theory Case Study of a Successful Large Scale ICT Adoption in Kosovo

Kealy, A. & Stapleton L. (2015) Progress and Change in Post-conflict Developing Regions: Observations of A Longitudinal Grounded Theory Case Study of a Successful Large Scale ICT Adoption in Kosovo *Proceedings of the IFAC Conference in Technology, Culture and International Stability (TECIS), Sozopol, Bulgaria 2015.* Holland: Elsevier. (Appendix I).

4.6.1 Research objectives and methods

The objectives of this short paper were to explore the changing surroundings of TCK during the successful adoption of ICT. The Curve of Conflict (Lund, 1996) was used as an analysis tool to apply to the different stages of the conflict and especially the post-conflict phase. The Curve of Conflict was chosen because it sets out a pathway along which post-conflict regions travel over time. It had not received much attention in the information systems literature. The objective of using the Curve of Conflict was to explore whether a formal model could be used to inform large scale ICT projects in a post-conflict setting. The changes and the growth of TCK observed during the study were explored. This paper consisted of a brief analysis of concepts which emerged from the four visits to TCK. Interviews, observations, photos and video gathered by the researcher were analysed for this section of the research. The concepts were briefly explored under the headings: changes to the centre, surrounds of the Hospital, and the workers in TCK.

4.6.2 Results

The results showed there were many changes observed during the successful adoption of the ICT in TCK. When these changes were compared to the Curve of Conflict the Lund model seemed to align with the success of TCK, under the three headings explored. Interview data and photographic data provided evidence of changes observed.

4.6.3 Relation to the whole

Understanding the management of ICT adoption in the evolving surroundings of a post-conflict region is an important element in understanding the success of TCK. Although this was a short paper, the findings observed added another layer to understanding to the scope of the success of TCK. This paper was a culmination of the four visits the researcher carried out in TCK and allowed for an overview of the changes in the region over the time of the study.

It was evident that the curve described the trajectory of TCK over the duration of this longitudinal study. This further confirmed conflict as an important theoretical category and helped unpack how conflict shaped the TCK initiative.

4.7 The Politics Of Success: A Case Study Of Telemedicine Projects In Post-conflict Regions

Kealy, A. and Stapleton, L. (2016). The Politics Of Success: A Case Study Of Telemedicine Projects In Post-conflict Regions. *Journal of Global Information Management* (pending) (Appendix J).

4.7.1 Research objectives and methods

The objectives of this paper were to fully explore three concepts 1) conflict, 2) external influences and 3) local politics in the successful adoption of ICT. These concepts were then explored under the headings of the three isomorphic processes of institutional theory, 1) coercive, 2) mimetic and 3) normative, to confirm is this theory reflected the success factors of TCK.

This paper consisted of an analysis of concepts which emerged from the four visits to TCK. Interviews, observations, photos and video gathered by the researcher were analysed for this section of the research. The concepts were explored under the headings: local politics, funding, adapting to the ministry of health, dealing with corruption, political instability: local elections, the transition from socialism: example – privatisation, international influences, and ethnic challenges.

4.7.2 Results

The findings showed that there was little evidence of mimetic isomorphism, some evidence of normative isomorphism, and that there was considerable evidence of coercive isomorphism. The findings also suggested that there were limitations to institutional theory in the context of ICT adoption in post-conflict developing regions. Institutional theory did not emphasise or distinguish between local and external influences. There was evidence of the political influence of external agencies; this is not a feature of institutional theory that has received much attention in respect of post-conflict adoption. There was also a lack of emphasis in institutional theory on the need for management to be flexible, whilst still maintaining institutional legitimacy.

4.7.3 Relation to the whole

This paper provided an in-depth analysis of the most frequent concepts to emerge from the analysis of the data gathered from the four visits to TCK: local politics, change and revolution, and U.S Influence/external influence and conflict. These concepts were thoroughly explored in a continuation of the initial research produced in Appendix F. The results of this paper brought the study to saturation, and finalised two major points of this research study. Firstly, the findings suggested that successful management of the politics of the region and of TCK allowed for the success of TCK itself. Secondly this paper explored the flaws in institutional theory when applied to ICT adoption in post-conflict developing regions.

The categories of local politics, change and revolution, and U.S Influence/external influence and conflict were subsequently explored further and contributed to the eventual synthesis of the politics/institutional spiral and the symbols/hope/conflict spiral of the spiral model (Section 5.4). Institutional theory (Scott, 2001; Selznick, 1996) was also explored further and this also contributed to the eventual synthesis of the of the spiral model (Section 5.4).

5. DISCUSSION

5.1 Symbolism and Hope

The findings of this study indicate that what the telemedicine centre symbolised for the participants played a role in the success of the centre. As discussed in publication 2 (Appendix E) ethnic Albanians had very limited contact with the outside world before and during the conflict. Progress and growth of computer technology and the Internet was known about, but not experienced. There was little access to up-to-date medical educational material. *"outdated books from the 1960's and 1970's - huge lack" (male IT worker) "We didn't have computers and internet when the others did" (trainee doctor and male e-librarian) "In 2004 introducing the e-library was like science fiction"(male IT worker)*

The technology could be seen as a metaphor for progress and change, the modern accoutrements of a life without the repressive society and conflict they felt they had experienced. *" Pre-war we were in a deep sleep – not well educated as country with someone on top of you" "This (telemedicine)is a sign that we are in the future" "enables you to think deeply, this is the future of the world"(female medic)*

The support of the army (KPC) as discussed in section 8.2 of publication 3 (Appendix F) was of great importance to the workers at the centre. In the chaos and uncertainty in the immediate aftermath of the conflict, the army and its structure was one of the only means of providing structure in the community. The army had been described as the "bringer of change", and that metaphor carried through to the telemedicine centre. *"Kosovo Protection Corps (KPC) supported the telemed centre" (male IT worker)*

Symbols of the aftermath of the conflict were prevalent in the cities and surrounds of the centre. The evidence of US intervention included: statues and flags around the city of Pristina.

Figure 4 Signage with Donation Details for TCK

Figure 5 The Samaritans Purse Sign

The signs shown in figures 4 and 5, sections 5.1 and 5.2 in publication 2 (Appendix E), were reminders of the emergency situation in the immediate aftermath of conflict.

These signs were at the entrance to the emergency centre where TCK was located and people working there would have to pass by them on their way to and from the centre.

There is also evidence that symbols in post-conflict regions related to successful implementations. The telemed centre and its technology were in stark contrast to the building it was housed in, the surrounds of the hospital and the city. Figures 6 and 7 included in section 6.1 of publication 2, (Appendix E) show the emergency ramp at the entrance to the emergency centre, the same entrance for the telemed centre. The contrast between the darkness of the stairwell and the light from the clean and modern telemedicine centre suggest the physical manifestation of what the participants reported they had hoped for during the conflict: peace, and a chance to bring Kosovo into the twenty first century with modern medicine and technology. The technology represented something more than improved functionality; it embodied a new, previously hoped for future.

Figure 6 Top of the Ramp

Figure 7 Stairwell to TCK in Pristina

Evidence suggested that people were motivated by a vision of a new future and this compelled them to extraordinary expressions, commitments and actions. Understanding and using the motivations of the participants who developed and deployed the system, could potentially lead to a better understanding of a systems likelihood of success. The evidence discussed in section 7.2 and 7.3 of publication 2 (Appendix E) describe the motivations of the participants. The telemedicine centre and the technology in it was a physical representation of those motivations, which in turn were energised by the possibility of a future beyond conflict which the technology itself embodied. The clinical educational and cultural benefits were discussed, *"everything comes – clinical educational cultural – back to benefit" (male medic and director) "benefits are huge" (male IT manager).* All of the "new stuff" after the conflict was seen as a positive advancement: *"After war all this new stuff" ..."everything changed in better way" (female medic)*

Symbols of hope were also found to be important in the telemedicine centre. The modern technology and decor of the centre, in stark contrast to the surrounds of the centre, symbolised what the people of the telemedicine were working towards in their

society: motivation for better lives and peace. Metaphors of the removal of dead pigeons *"6 trucks of dead pigeons" "laid the cables ourselves" (male IT manager),* and TCK considered like their own child *"People who work here consider telemed one of their babies and will not let it go"* (*male medic and director*), show how important the centre was to a new future. The centre was also described as a *"medical revolution (trainee doctor and male e-librarian).* This metaphor was particularly significant in this post-conflict situation. The multiple use of the word "benefit" when referring to the outcome of having the centre was also indicative of the hope the centre symbolised.

5.1.1 Synthesis

TCK operated in a dynamic environment, an environment in constant flux. In soft systems methodology Vickers (1984) puts forth that successful management is possible with the maintenance of relationships within, and outside of, an organisation over time (Vickers, 1984). This "appreciative system" requires the ability to adapt to changes over time (Vickers, 1984). Checkland and Cesar (1986) described the appreciative system as a number of interweaving loops, to represent the constant changing and flux of events and interactions (Checkland and Casar, 1986).

Stapleton (1999) used the spiral symbol to represent the process by which people make sense of the new, dynamic and complex world which emerges when new advanced technology is introduced. The spiral symbol (Fig. 8) represents the environment of TCK, with the influence of hope and the conflict in the region part of the dynamic environment.
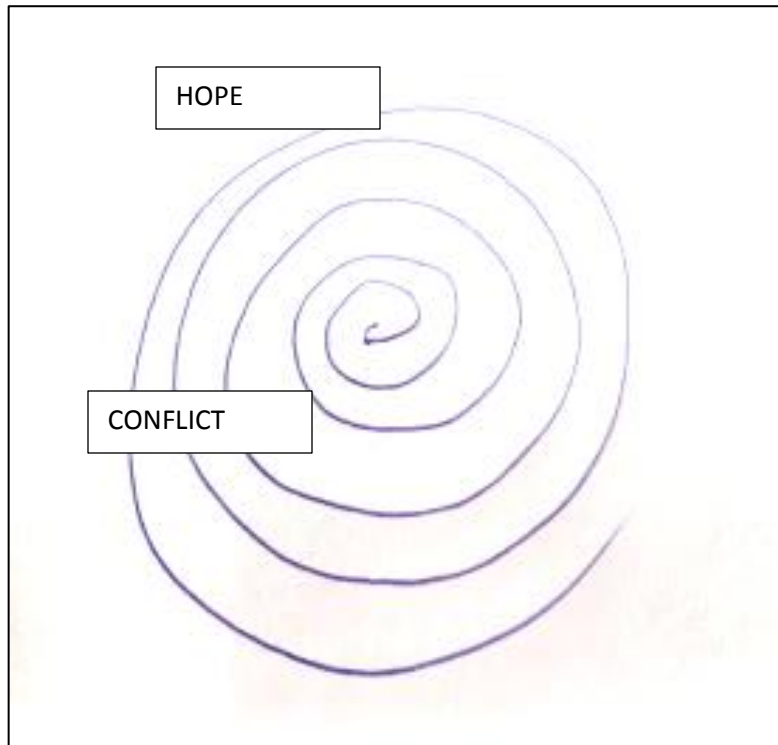
Figure 8 Symbolism and Hope Spiral

The spiral of hope and conflict in Fig. 8 is used because it embodies how people made sense for the tension between hope and conflict in the new spaces created and symbolised by the technology. The spiral is:

1. Not linear – it is moving away from a traditional linear perspective.
2. In motion – without definitive prescribed path, and reflects the contingent nature of information systems development initiatives.
3. Reflecting a feedback/learning cycle
4. Reflecting a never ending environment that will constantly need management.
5. Multi-dimensional – hope and conflict.

5.2 Theory of Hospitality

The successful implementation of a large scale ICT project in a post-conflict region can load additional complications to an already complex systems development activity. Ciborra (2002) argued that ICT creates a backdrop for human actors that work with it. There was evidence of this in the interview data, for example: *"Internet, the idea you are free. Then international symposium – good for you – you can consult doctors in another part of the world" (female doctor),* a backdrop which reflects the ideas of the human actors, and can both reflect *"Constant hope and motivation – the future is in technologies, no reason to go back or to be disappointed" (female doctor),* and impact on the organisation *"Is not science fiction any more – it is part of what they do" (male IT manager)* it has become part of. This was evident in the findings from the successful implementation of TCK as seen in the findings in section 7 of publication 5 (Appendix H).

The hosts' identity changed with the hosting of the technology, both through the realisation of previously hoped for changes *"we knew and hoped something is going to change", "hope was all we had left" (male IT manager)* and through losing fears associated with gaps in their skill sets, medical staff were described as *"afraid of not knowing what they should know" (male IT manager),* however it was observed by the staff that the educational advantages of hosting the technology brought bigger numbers of medical staff into the centre *"this brings them back", "then told about lecture happening, they come back one after another" (male doctor and director).*

Not controlling the technology and allowing it to be utilised in different ways was evident in TCK, as the technology was used in ways that differed from its original purpose as Ciborra had described *"saw colleague take ultra sound in phone and send to colleague, was surprised, but people are using these things" (female doctor) "smart phones and camera phones developing so fast" (male doctor and director).* Using email instead of official equipment to send information was also evident *"cost to use Vital net but email no costs" (female doctor).*

The new confidence the hosts developed with the technology enabled them to say yes or no to the technology and to the centre. The perception of the technology and the centre dictated how the centre and its technology were received, by TCK IT staff and medical staff. *"This (telemedicine) is a sign that we are in the future" "enables you to think deeply, this is the future of the world"(female doctor).*

The communities of practice which emerged in the medical centre also demonstrated how the technology impacted the host as seen in the findings in publication 4, section 5 (Appendix G). It was reported by the interviewees that some welcomed the technology as part of a hoped for change. "*Kosovan doctors abroad who want to consult back with doctors in Kosovo" (male IT manager).* The IT worker had a file with online medical consultations made in Spain, Austria and Germany *"different doctors have friends abroad" "– know the doctors – Albanian doctors" (male IT worker).*

Others were reported as resenting the sudden influx of new technology and the changes it brought *"(reluctant users) impose their own way – this is like this, you cannot tell me otherwise" (male trainee doctor and e-librarian).*

The impact on the people in TCK because of hosting the technology emerged as one of the main factors which influenced the success of the centre. These findings suggested that to examine the success rate of large scale technology projects in post-conflict developing regions this impact of the technology should be explored as a defining factor.

5.2.1 Syntheses

The second spiral depicted in Fig. 9 represents the navigation of TCK through the dynamic environment of a post-conflict region. Ciborras metaphor of ICT creating a backdrop for the human actors is at work here, where the guest and the host navigate through the chaos of a post-conflict environment. The spiral represents the process of

people making sense of this dynamic between guest and host, a dynamic interplay which formed part of the backdrop to the TCK technology deployments.

Figure 9 Host and Guest Spiral
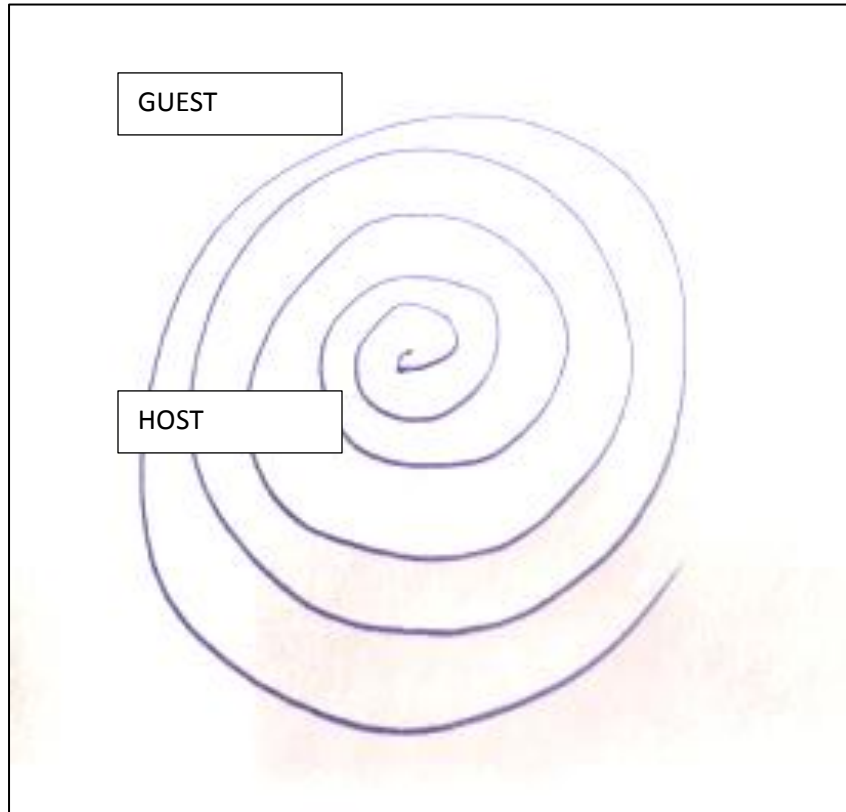
The spiral is:

1. Not linear – it is moving away from a traditional linear perspective.
2. In motion – the dynamic nature of the relationship between host and guest.
3. Reflecting a feedback/learning cycle – learning what it means to host this guest.
4. Reflecting a never ending, contingent environment that will constantly need management.
5. Multi-dimensional - host and guest.

5.3 The Political Environment and Institutional Theory

The findings of this study showed evidence that institutional theory does not sufficiently emphasise the importance of local and international politics in the successful adoption of ICT in post-conflict countries. Management of local and international politics emerged from this study as a factor in the success of TCK.

The findings of section 5 (Appendix J) showed little evidence of mimetic isomorphism. There was some evidence of normative isomorphism, as seen in Section 5.3 Adapting to the Ministry of Health (Appendix J). Visits to train in the U.S. were described as a great enhancement to professional skill, and better than what was available in Kosovo which indicated normative isomorphic processes for example: *"more professional, developed skills more" (trainee doctor and male e-librarian) "Positively motivated by American visit" "I hope it will be as good for Kosovo" (female medic).* With the issue of coercive isomorphism however it was evident that there were gaps in this theory which need to be addressed and which are set out below:

It was stated in the findings in sections 5: Local Politics, Funding, Dealing with Corruption, International Influence, and Ethnic Challenges (Appendix J) that there is little emphasis or distinction between local and external international agency influences. How the staff of TCK managed these influences was instrumental in their success. This has not received much attention in institutional literature. The staff of TCK managed the political system in place, from the beginning of the centre it was not part of the Ministry of Health *"Lucky and independent" did not have to face usual bureaucracy" (male medic and director).* They had to make sense of this on a constant basis as the political environment proved to be very dynamic. For example, when they were transferred to the Ministry of Health, they adapted, doing what they needed to keep the Ministry on board, despite the chaotic environment, and making sure that TCK remained operational *"Structure had to change when transferred to Ministry of Health. Had to adapt, to suit Ministry of Health" (male IT Manager). "find ways to survive when faced with no funds" (male IT worker)", "now financed by Ministry of Health -*

some extra budget for operational costs, small but working with it" (male IT Manager)
"Most important to get authorities on board, also enthusiastic people, But need
authorities! We kept going on ...many changes in politics...always an issue" (male
medic and director).

The staff of TCK also attempted to keep political discussion out of TCK *"[TCK]*
Management very fair, careful - ask us not to bring politics into work – so that is fair.
That is different from outside/other institutions" (male doctor and e-librarian).
The influence of global agencies and the impact of being a formerly socialist society
has not received much attention in institutional theory. This is seen in section 5: The
Transition From Socialism: Example – Privatisation, International Influence (Appendix
J). It is also seen in section 7.1 Conflict and U.S Influence (Appendix E).
"No social security, no one pays for medical service - hospital needs profits!" (male IT
Manager) To have insurance is [now] key to success – for telemedicine and for
everything (female medic associate) "[Back in socialist Yugoslavia] Responsibility was
higher, state over you, there was responsibility – quality was recognised. Of course
people stole in socialism – but not like now" (male medic and e-librarian).

The need for flexibility and institutional legitimacy were features of post-conflict
institutions as experienced with the people involved with TCK, as seen in section 5
(Appendix J): on
1) Funding *"find ways to survive when faced with no funds" (male IT worker)*
2)Adapting to the Ministry of Health: *"Re-licence from Ministry of Health for doctors*
who give lectures on e-health to other centres- getting very busy, up to 3 lectures per
day" (male IT Manager).
3) Political Instability: The Elections show the need for flexibility when trying to
progress the service at TCK *"National telemed health services incorporated into law,*
but now with no government in place, waiting for things to happen. We want telemed,
workers want to be compensated, components are in place, more or less, waiting for the
government" (male medic and director).

4) Ethnic Challenges: Dealing with different ethnic groups in a post-conflict region

"Serbian doctors and nurses came to lectures but not as much. So keen to have this but had to get green light from Belgrade" (male medic and director).

5.3.1 Synthesis

The spiral in Fig. 10 represents the chaotic environment in which the staff of TCK found themselves in. The evidence suggested that the skills of navigating this environment were a crucial element in the successful navigation in the political environment by TCK. The dynamic interplay between institutions and TCK is represented by the spiral. The boundaries between TCK and these institutions were constantly set and re-set, as time moved on and the tensions between TCK and the institutional and political context in which TCK found itself played out.
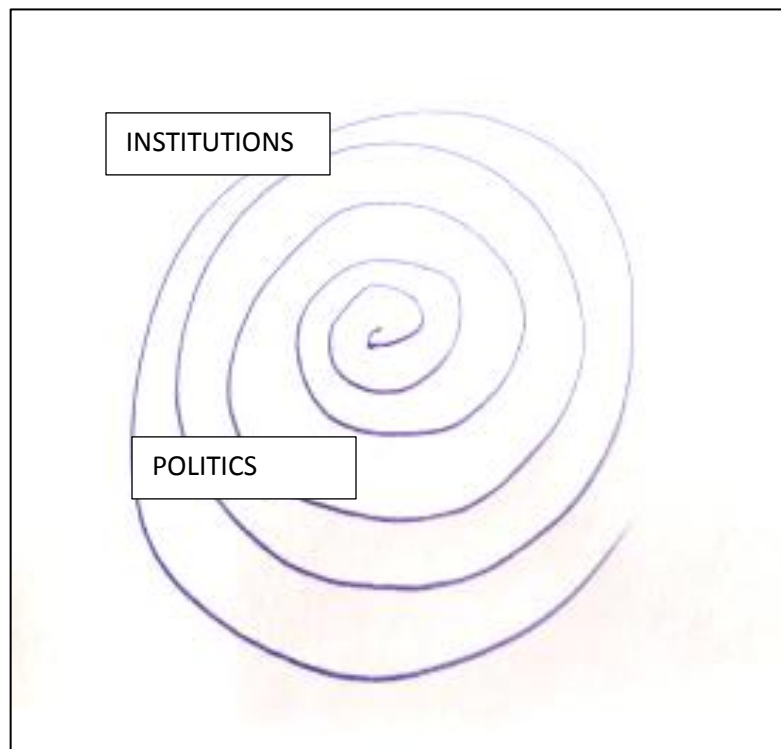
Figure 10 Politics and Institutions

The spiral is:

1. Not linear – it is moving away from a traditional linear perspective.
2. In motion – without definitive prescribed path, and reflects the contingent nature of information systems development initiatives.
3. Reflecting a feedback/learning cycle – learning to adapt – mutual shaping TCK was dominated and negotiated with more powerful institutions.
4. Reflecting a never ending environment that will constantly need management.
5. Multi-dimensional – institutions and the politics

5.4 Timeline of Research Outputs

Figure 11 summarises the timeline for publications arising from the research. This led to the formation of the framework, as set out in the next section.
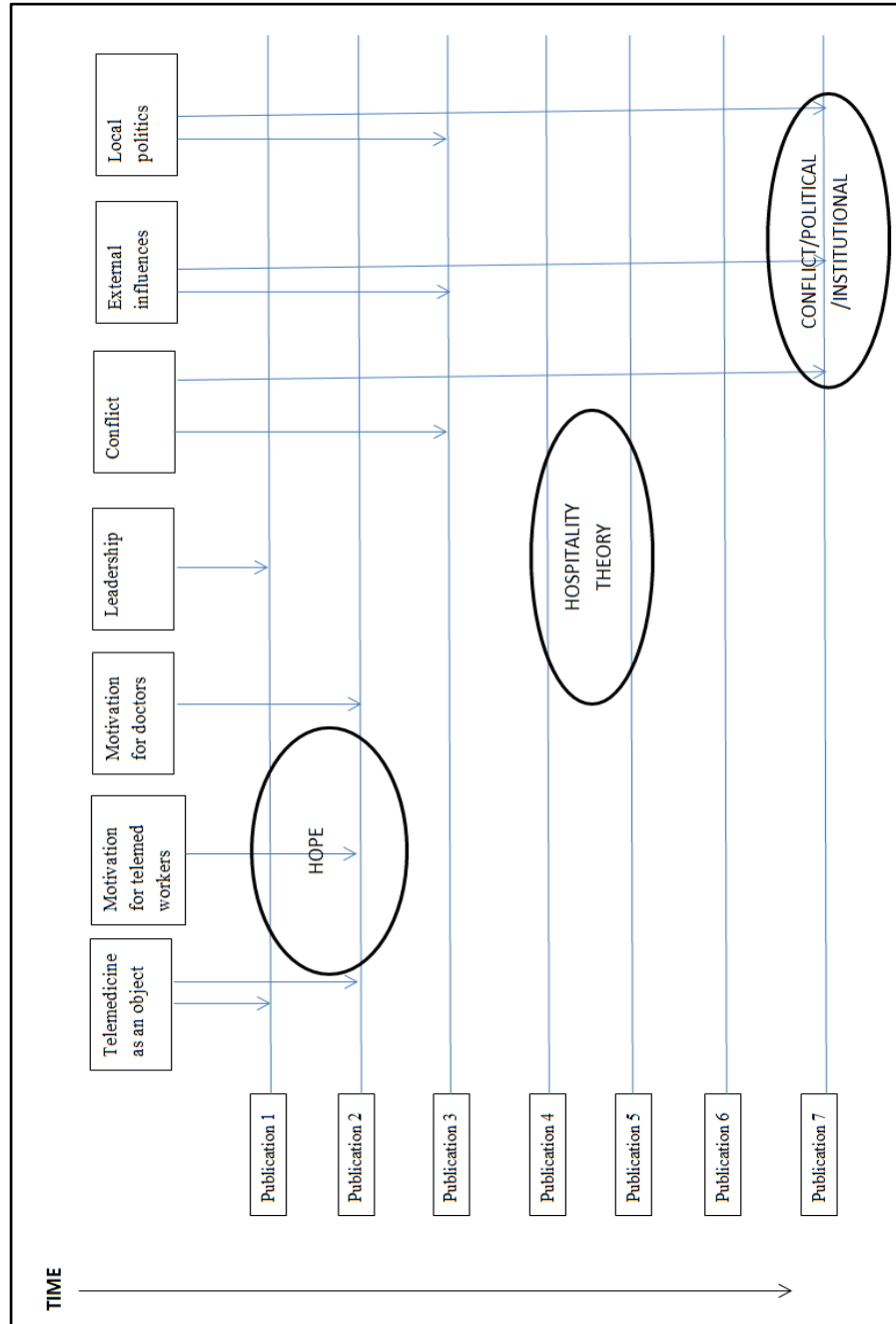
Figure 11 Timeline of Research Outputs

5.4 A Post-conflict Information Systems Adoption Framework

From previous sections summarised in Figure 11 Timeline of Research Outputs it is possible to synthesise a more general framework. Figure 12 A Post-conflict Information Systems Adoption Framework consists of a framework using the three spirals shown in Figures 8, 9, and 10, coming together around TCK to show how the three concepts of Symbols and Hope, Host and Guest and Politics and Institutions interplay in a dynamic and chaotic environment. TCK, representing a successful socio technical system, is at the centre, constantly in flux, interacting with and expressed through these concepts/spirals. Figure 12 represents a synthesis of these three concepts, and the way the spiral shaped the ICT development process evident in the papers listed in the appendices. This corresponds with the central theme to Vickers (1984) view of soft system methodology, where understanding the ideas and perceptions an organisation holds about itself and its environment is essential to understand events, organisations and the workings of organisations. More work is needed in order to develop the spiral in to an ICT development operational methodology, although the spiral model provides a solid basis for this.
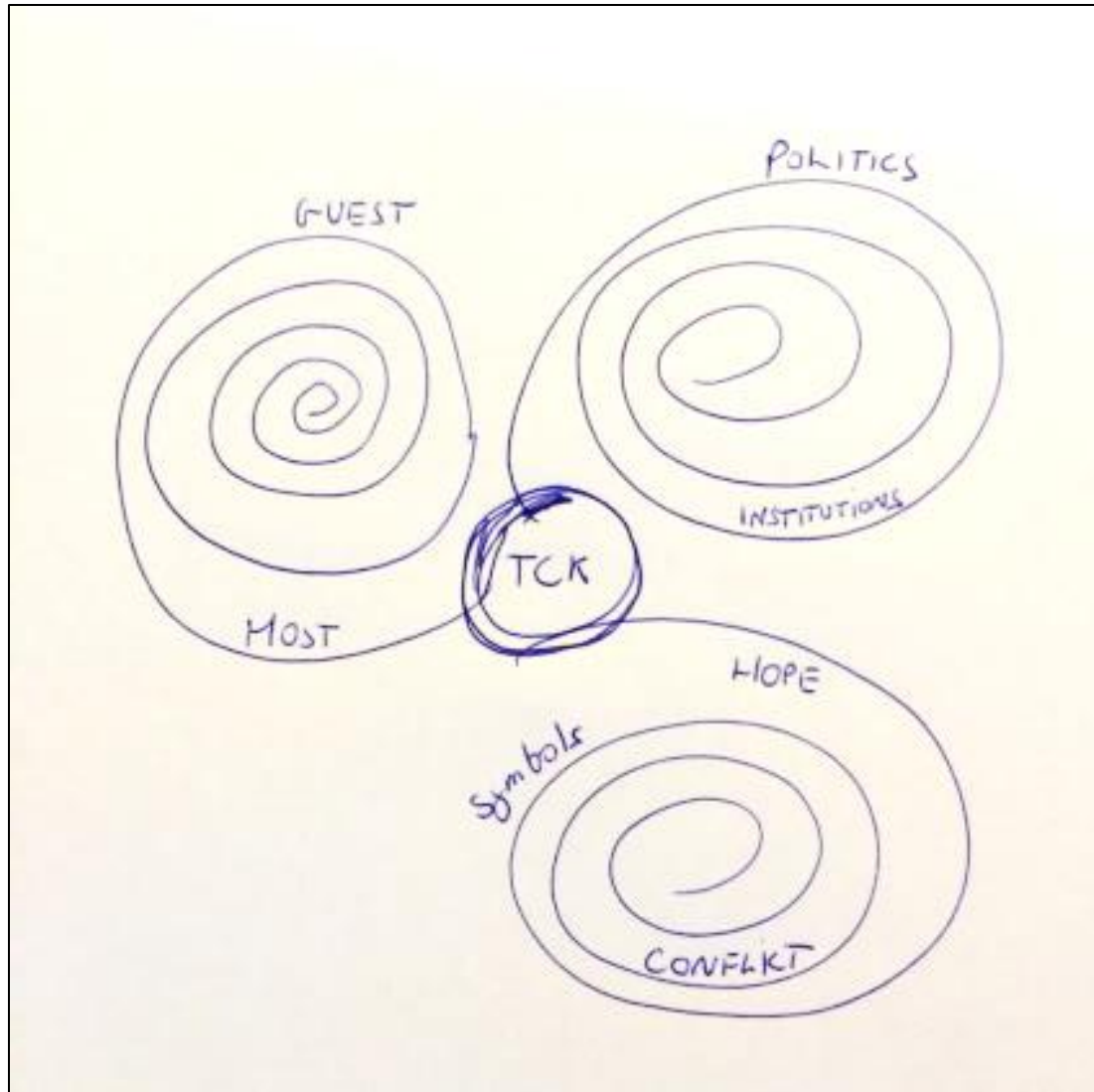
Figure 12 Post Conflict Information Systems Adoption Framework

The interweaving spirals represent a socio technical system which is:

1. Not linear – it is moving away from a traditional linear perspective.
2. In motion – without definitive prescribed path, and reflects the contingent nature of information systems development initiatives.
3. Reflecting a feedback/learning cycle.
4. Reflecting a never ending environment that will constantly need management.
5. Multi-dimensional.

6. CONCLUSIONS

The aim of this study was to explore the previously poorly understood domain of ICT development and deployment in post-conflict regions and from there, set out key factors ICT project teams encounter in post-conflict developing regions.

The primary objective of this research was to explore these factors in an ICT development initiative in a post-conflict developing region through the lens of everyday human existence and the symbolism which informs it.

This research suggests that symbols and symbolism, hospitality and management of local and international politics are significant influences during the development and deployment of telemedicine technology in post-conflict regions. Technology is shown to be more than a technical artefact; it provides a setting for ritual and symbolic thought and action. The technologies that were part of the telemed centre allowed for the expression of hope for a better future, and a more inclusive, peaceful society through the provision of world class educational and medical facilities. Management of the local, national and international political context were crucial as a means to make progress. The success of TCK was brought about by negotiating a path to a new future in the context of the past.

6.1 New Theory and New Practice

TAM and Institutionalism have been widely studied and are accepted theoretical frameworks for technology adoption and deployment. However, neither of these sufficiently addressed the symbolic importance of the technology, the role of hospitality, or the management of local and international politics in a post-conflict setting. Coercive isomorphism needs careful attention in particular: the absence of the role in managing local and external influences and the importance of the political influence of external forces was notable. The literature is also lacking in more in-depth exploration of the need for flexibility and achieving institutional legitimacy in the

extreme context of a post-conflict region which is also in transition. Consequently this study contributes to new theory for such regions.

The implications of this study for large scale information system managers operating in post-conflict regions were clear. It had the potential to impact on engineering development and adoption methodologies by incorporating new factors into management of the systems development process, and highlighting factors that were previously poorly understood or generally omitted.

The research methodology set out in Chapter 3 involved a complex process of sensemaking. This process itself could be the focus of future methodological research which can improve understanding of how grounded theory and action research studies can be conducted in the highly dynamic and complex context of post-conflict regions.

There were also broader implications for strategic technology adoption in the aftermath of conflict, and the impact on international stability. According to Lund (1996) Curve of Conflict, set out in Appendix I, is in a state of negative/unstable peace. This implies that the region is not moving backwards on this curve, mirroring the success of TCK. Consequently this study contributes to new practice in the management of IS projects in these highly dynamic, even chaotic environments.

6.2 Limitations

The methodology of grounded theory was not suited to generalising all of the findings, therefore some of the findings of the study were limited to telemedicine in a particular context. While the researcher made every endeavour to speak to as many members of staff and to re-interview all interviewees, this was not always possible, and this weakened the evidence. The nature of employment at TCK was volatile, due to finances and political issues. Members of staff were not always available and medical staff who were reported to be reluctant to use TCK were not available to a researcher exploring TCK. There were also limitations to the timescale available to the researcher and access to non-Albanian ethnic groups.

6.3 Future Research

While the UN and other international agencies have assigned "post-conflict" as a term to describe certain territories as particularly unstable, the term is not well defined as a complex system. Future work should determine the particular properties and features of post-conflict regions as special cases of less developed regions in which technology is deployed. This might shed more light on ICT adoption factors.

Future studies of communities of practice and their impact on the adoption of technology could lead to a better understanding of how ICT can be adopted in post-conflict regions. This research could apply and validate the spiral model within communities of practice. Future work could also see the development of the spiral in to an ICT development operational methodology.

Future research could test the findings of this study against other post-conflict technology adoptions, and other telemedical adoptions. The lack of post-conflict context research poses many questions about technology adoption factors in these regions. Testing the findings in a general ICT deployment scenario, without a post-conflict influence, could also lead to a greater understanding of factors affecting the success or failure of ICT adoptions.

Post-conflict regions merit much more attention from researchers interested to understand and propose ways in which human existence can be improved by advanced ICT. They are places in which people seek new hope for a peaceful, stable future. Technology can come to symbolise that hope. This study has demonstrated that there are communities on the ground working in the most difficult circumstances who, through the deployment of advanced technology, are effecting positive change in the conditions of life. These communities are truly inspiring.

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Appendix A

Questionnaire 1

This Questionnaire was used in Phase 2, and was developed following coding of open interviews in Phase 1 in November 2008.

The Telemedicine project was an extremely complex initiative involving many years. Many projects involving complex information technology fail for a variety of reasons. Our study tries to understand the particular issues that make successful projects successful. We are particularly interested in post-conflict developing countries, and want to try to understand the particular factors that are involved in these contexts.

The discussion will be open-ended, but we hope to understand how the following 10 issues were managed:

1. **Introducing the New System:** How was the system introduced to the doctors/consultants? What was their initial reaction?
2. **Overcoming Fears:** How did you become aware that doctors feared being exposed as having a "lack of knowledge" and how you helped them overcome these fears?
3. **Culture**: Do you think there are important cultural issues associated specifically with the medical profession in Kosovo? How do these manifest themselves when working with complex technology projects here?
4. **Ethnicity and Cultural Values:** What things do you think are important to consider when working with complex technology projects in the Kosovan culture? How has the ethnic divide impacted upon the project? What are the important values in Kosovan culture that can help or hinder a project like this?
5. **Personal Values:** What are the important personal values that you feel are important in leading projects like this in Kosovo? What are the important personal values for leaders and participants in projects in developing countries/post-conflict zones?
6. **How the technology became a material culture?** What were the basic resources they began with and how they were consolidated to achieve what they ended up with? What resource was the hardest to handle and how did they handle it?
7. **Post-Conflict Developing Context:** Kosovo was in a post-conflict, emergency phase during the early stages of this project. How did this impinge upon the project and how was this managed? Were there particular technical difficulties (e.g. unstable infrastructure)? Were there non-technical difficulties specifically related to the situation in Kosovo?
8. **Education and Training:** How did education and training change people's perspectives? How did the users come to make sense of the new technology? Was there any particular educational approach they started with and how did it change?
9. **Relationships and Power:** Were there other relationships that were difficult to build and manage? How was this done? How did the political situation in Kosovo effect the project? How was this managed?
10. **Shifting Perceptions:** How did the technology itself effect how people perceived themselves or others? How did the technology itself effect how people perceived medical practices?

If there are specific issues not listed above which the team feels were very important in managing the Telemedicine Project please share these also.

Thank You   Falemenderit shumë

         ХВАЛА

Appendix B

Questionnaire 2

Questionnaire 2: October 2012. Deeper Analysis of concepts arising from Phase 2.

This Questionnaire was used in Phase 3, and was developed following analysis of data arising from interviews informed by Questionnaire 1 used in phase 2 of the research (See Appendix A).

1.Technology

1. Where did the technology come from?
2. What did it mean to get this technology?
3. Was the computer technology for TCK designed specifically for TCK?
4. Was the technology pre designed and installed per design?
5. What were the system architectures?
6. What were the system requirements?
7. Did any of the key players have any control over the design or how it was installed?
8. How did you come to understand the priorities (e-Learning became the biggest tool?)
9. Is there any new technology since last visit?
10. What did the technology symbolise to you?

2. Staff

1. How did the organisational structure arise? How did it emerge
2. Were there relationships between people prior to the setup of TCK?
3. Who selected medical staff?
4. Who selected non-medical staff?
5. On what basis were staff selected?

3. Hope

"hope was all we had left"
1. Are there links between hope and the success of the project? If so what are these links? Are they symbolic? In what way?
   a.   If there were links- how did hope link with success?

4. Conflict?

1. One aspect - doctors needed more training. Can you tell me more about how the conflict in the region shaped the technology requirements?
tool)
3. Are there links between the conflict and the success of the project? What are these links?

4. What was the structure of command in early days of centre, relationships between key players? Was the structure of command linked to the military structure of command?

Appendix C

Questionnaire 3

Questionnaire 3: June 2014. Deeper Analysis of concepts arising from Phase 3.

This Questionnaire was used in Phase 4, and was developed following analysis of data arising from interviews informed by Questionnaire 1 and 2 (See Appendices A and B).

The Hosting process reveals a number of features:

1. *Hosting technology successfully will redefine the identity of the host: successful hosting creates symmetry between the host and the guest, when the host becomes the server of the guest, they adopt rituals to do so, which are culturally dependant.*

   1. Did working with the technology change you?
   2. Which stages of the project do you remember changing? Beginning? End?
   3. Did you have to change work practices/methods learned in training in the US to fit working with the technology in Kosovo?

2. *Any attempt to control the technology leads to failure – this can be seen in unexpected results. The concept of cultivation (Dahlbom and Janlert, 1997) suggests a developing and adopting technology is a natural process which needs support and monitoring, control of the technology is impossible. According to this approach, technology can be shaped by the culture in which it is adopted into.*

   1. Were there any unexpected results using the technology? Anything that differed from training specific to working in Kosovo?
   2. Were there instances where workers had to work around the technology?

3. *Different cultures have different codes, norms and rituals for hospitality, the technology most accept them. Callon (1991) argues that if the cultures of the host and guest are too far apart, mediators play a crucial role.*

   1. Did you ever have to act as mediator between hosts and technology?
   2. Was there anything about the technology that was very different than expected before it arrived at TCK

4. *The technology has a right to visit but not to stay* (the right to say yes or no to technology).

   1. Were there any aspects/types of technology you doubted would work in TCK?
   2. Was there any technology that was rejected by IT team or doctors completely?

5. *If the technology is perceived as hostile, the host will treat it as an enemy: communication across languages and cultural modes could lead to misunderstandings. The ambiguity of the guest can exacerbate this.*
   1. Was there any evidence of technology as an enemy in the IT team?

2. Were there any misunderstandings due to technology? Between IT team members? IT and Doctors? Doctor and Doctor?

The foreign visitor has the ambiguity of a stranger, it is either a friend or an enemy. The guest (technology) comes with its own underlying forces, and will have needs and constraints that the host serves. (Ciborra, 2002). The consequences of hospitality for the guest are found to be:

1. *The humanisation of the technology – can be more intriguing than the virtualisation of reality.*

   Was there any evidence of the humanisation of technology?

2. *The hosting organisation is at the service of the technology, but technology cannot dominate it.*
   - Were there any situations when the technology became dominant and was not enhancing the users work?
   - Did the technology

3. *When it becomes an enemy, it will exploit the host, find allies among certain groups, and drop these allies when no longer needed.*

   Did you find that certain groups had different reactions to the technology?
   Differences in levels of negative/positive reactions? Among IT staff? Among Doctors?
   Did you find reactions changed over time? How did this show itself?

If there are specific issues not listed above which the team feels were very important in managing the Telemedicine Project please share these also.
Thank You   Falemenderit shumë   ХВАЛА