CORA Cork Open Research Archive
Cartlann Taighde Oscailte Chorcaí

Title	Theorising antecedents of cohesion and conflict in distributed ISD project teams
Authors	McCarthy, Stephen;O'Raghallaigh, Paidi;Fitzgerald, Ciara;Adam, Frédéric
Publication date	2018-12-01
Original Citation	McCarthy, S., O'Raghallaigh, P., Fitzgerald, C. and Adam, F. (2018) 'Theorising Antecedents of Cohesion and Conflict in Distributed ISD Project Teams', Proceedings of the 39th International Conference on Information Systems, San Francisco 13-16 December.
Type of publication	Conference item
Link to publisher's version	https://aisel.aisnet.org/icis2018/behavior/Presentations/19/
Rights	© 2018 the authors.
Download date	2026-11-06 20:07:16
Item downloaded from	https://hdl.handle.net/10468/7294



University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

Theorising Antecedents of Cohesion and Conflict in Distributed ISD Project Teams

Completed Research Paper

Stephen McCarthy
Cork University Business School
University College Cork
Western Road, Cork, Ireland
Stephen.McCarthy@ucc.ie

Paidi O'Raghallaigh
Cork University Business School
University College Cork
Western Road, Cork, Ireland
P.OReilly@ucc.ie

Ciara Fitzgerald
Cork University Business School
University College Cork
Western Road, Cork, Ireland
CFitzgerald@ucc.ie

Frédéric Adam
Cork University Business School
University College Cork
Western Road, Cork, Ireland
FAdam@ucc.ie

Abstract

The effectiveness of distributed ISD teams is often inhibited by tensions between contextual (macro) and localised (micro) factors. In light of these challenges, literature suggests that cohesion is a key determinant of team performance; however, competing literature asserts that conflict is essential for exploiting diverse knowledge. This suggests a paradoxical need for both cohesion and conflict. However, extant ISD literature has yet to explore how the interplay of macro- and micro-level factors affect cohesion and conflict in distributed settings. To address this gap, we present and utilise a theoretical framework to analyse ethnographic data from a distributed ISD project called 'Athena'. The findings point to a 'double edged sword' of cohesion and suggest that moderate levels of task-based conflict are essential for addressing diversity in distributed teams. Additionally, excessive levels of cohesion can contribute to social conflict between subgroups when task conflict is constrained.

Keywords: Information Systems Development, Team Cohesion, Team Conflict, Subgroups

Introduction

Recent advances in technology have drastically altered how Information Systems Development (ISD) teams collaborate and share knowledge (Garrison et al. 2010). In particular, sophisticated IT solutions such as video conferencing and online collaboration tools have enabled the conduct of ISD projects on a previously unimaginable scale. However, despite these advances, the management of distributed ISD projects remains an inherently challenging task (Lim et al. 2011; Standish Group 2015). Increasingly, scholars assert that social aspects of complexity can have a significant impact on the performance of ISD project teams (Kotlarsky and Oshri 2005; Luna-Reyes et al. 2005). Social complexity can be defined as the forces which make effective communication difficult, and in turn lead to the fragmentation of individuals' understandings and intentions (Conklin 2005). Distributed ISD projects in particular are often characterised by social complexity due to tensions between the contextual (i.e. macro-level) and localised (i.e. micro-level) factors that shape social interactions (McCarthy et al. 2018a; Sarker and Sahay 2003). For instance, conflict can emerge due to contextual differences between the positions, interests,

and values of individuals and groups which in turn shapes their localised social interactions during the development of an IT artefact. In light of these challenges, literature suggests that cohesion is a key determinant of distributed project team performance (Garrison et al. 2010; Hummel et al. 2016; Venkatesh and Windeler 2012). However, competing literature equally asserts that task conflict is essential for team performance in order to capitalise on diverse knowledge flows around the problem and IT solution coupling (McAvoy and Butler 2009; Yang et al. 2015).

Project managers must therefore balance the seemingly paradoxical need for both cohesion and conflict in order to drive higher levels of team performance in distributed settings. According to Fairhurst et al. (2016), such paradoxes require new theoretical lenses which allow researchers to both 'zoom in and zoom out' from the localised micro-level interactions and the contextual macro-level factors in order to better understand the locus of paradoxical tensions. In particular, Fairhurst et al. (2016) assert that the interplay between macro- and micro-level factors can provide insights into how paradoxes emerge, change, and reproduce overtime. For instance, the emergence of paradoxes such as cohesion and conflict can be understood by investigating the interplay between micro-level interaction among individuals, and the large scale macro-level patterns. However, extant ISD literature to date has yet to explore the interplay of these macro- and micro-level factors and its impact on distributed ISD team cohesion and conflict.

This paper seeks to fill the gap in literature by exploring the interplay of factors which impact cohesion and conflict in distributed ISD project teams. Specifically, we seek to address the following research question: *How does the interplay between macro- and micro-level factors affect cohesion and conflict in distributed ISD project teams?* An in-depth investigation of this research question will be essential for deepening our understanding around the drivers of cohesion and conflict in increasingly distributed ISD environments. In this paper, we draw on empirical findings from the 15-month ethnographic study of a collaborative academic-industry ISD project called 'Athena'. We present and utilise a theoretical framework to describe and explain interactions among the team members.

The remainder of the paper is structured as follows: Section 2 provides a literature review of cohesion, and conflict in distributed ISD projects. Section 3 introduces the research design behind our ethnographic study. Section 4 outlines the theoretical framework of the paper and Section 5 presents the findings from the ethnographic study. Section 6 discusses the findings as relevant to academic and practitioner communities before Section 7 brings the paper to a close with a conclusion.

Literature Review

Distributed ISD Projects

ISD practices are increasingly conducted by distributed project teams consisting of individuals from different organisational, geographic, and disciplinary backgrounds (Garrison et al. 2010; Kotlarsky and Oshri 2005; Powell et al. 2004). Distributed ISD is supported by the availability of sophisticated IT solutions (e.g. email, video conferencing, and groupware) which allow ISD projects teams to collaborate across temporal, spatial, and organisational boundaries with relative ease. The conduct of distributed ISD practice has become increasingly prevalent in recent times as it enables organisations pursue a 'follow the sun' development model whereby the number of daily working hours is increased by locating team members across different time-zones (Conchúir et al. 2009; Sarker and Sahay 2004). For instance, it is proposed that distributed ISD practices can allow organisations to decrease their cycle time of development by integrating the clock time of different countries (Sarker and Sahay 2004). This would not be feasible in traditional co-located teams where individuals are situated in the same physical location (Jarvenpaa et al. 2004; Powell et al. 2004).

However, despite these proposed benefits, extant literature suggests that distributed project teams face inherent challenges around how they collaborate, learn, and manage knowledge (Carte and Chidambaram 2004; Windeler et al. 2015). For instance, Garrison et al. (2010) find that the inherent diversity of distributed ISD teams can have a negative impact on perceptions of group cohesion, trust, and performance. Team diversity can also result in the emergence of subgroups within the wider project team. For instance, subgroups can emerge due to perceived differences between the professional background, organisational affiliation, or demography of team members (Pflügler et al. 2018; Van Knippenberg and Schippers 2007). Subgroup members have a tendency to interact more frequently with members within

the subgroup than with those they consider as outsiders, which in turn can create social complexity due to the emergence of competing goals (Van Knippenberg and Schippers 2007). A number of factors have been found to contribute towards the emergence of subgroups including: diversity of positions, interests, cultural meanings and values (Carton and Cummings 2012; Kleinsmann and Valkenburg 2008).

In light of these challenges, it is not surprising that the rate of ISD project failures continues to remain stubbornly high (Standish Group 2015). While prior literature had initially conceptualised ISD as primarily a technical endeavour, there is now a growing awareness of how social aspects affect ISD team performance and project success (Doherty and King 2005; Kotlarsky and Oshri 2005). For instance, some IS scholars suggest that ISD practice primarily concerns the social construction of knowledge, where individuals and groups seek to collaboratively build new understanding around the development of a system (Lee et al. 2015; Luna-Reyes et al. 2005; Sawyer et al. 2010). In order to address social complexity, team members must continuously interact to share ideas, resolve conflict, and coordinate resources and the flow of information (Lim et al. 2011; Sawyer et al. 2010). However, understanding of the enablers and barriers to systems development in distributed settings still remains nascent. Findings from Windeler et al. (2015) points towards the need to further research around the relationship between cohesion and conflict in distributed ISD teams. While authors such as Garrison et al. (2010) and Barki and Hartwick (2001) have previously looked at cohesion or conflict in isolation, there is a dearth of ISD literature investigating the paradoxical tension between both them in distributed ISD projects.

Team Cohesion

Team cohesion can be defined as the extent to which team members are aligned in their shared understanding of and shared commitment to project tasks i.e. the actions that individuals and groups seek to perform based on an agreed plan (McCarthy et al. 2018b; Yang et al. 2015). Conklin (2005) asserts that the cohesiveness of work groups is dependent on both the level of shared understanding and shared commitment, and the willingness of individuals to engage in dialogue around inherent differences around their perspectives, understandings, and intentions. Firstly, shared understanding refers to the social process whereby the divergent perspectives of team members are transformed to generate collaborative knowledge building and enhanced team performance (Kleinsmann and Valkenburg 2008; Puntambekar 2006). Shared understanding does not necessarily imply that everyone shares exactly the same viewpoint but instead requires that team members recognise differences in interpretations and work towards collaborative knowledge building. However, shared understanding alone is not enough, and shared commitment is equally required for team cohesion to ensure that solutions can be effectively delivered. Shared commitment goes beyond the transfer of information and knowledge, and requires the commitment of time, effort, and resources by team members in line with proposals that have gained shared understanding (Briggs et al. 2005; Conklin 2005; Yang et al. 2015).

Team cohesion has been found to have a positive impact on team performance and collaboration in distributed team environments (McAvoy and Butler 2009; Venkatesh and Windeler 2012; Yang et al. 2015). Literature distinguishes between two forms of team cohesion: 'social cohesion' which refers to the interpersonal attraction between members of a group in terms of their values, identities, and norms (Windeler et al. 2015), and 'task cohesion' which refers to individuals' engagement with the team in terms of the divisions of resources, and procedures for completing tasks (Yang et al. 2015). Team cohesion is particularly crucial in order to help reconcile the different perspectives of distributed team members from different organisational, cultural and disciplinary backgrounds (Garrison et al. 2010). Team cohesion can help strengthen communication lines between team members, the level of task participation, and improve collaboration efforts around the accomplishment of a task; in addition, team cohesion can help teams better utilise the resources available while working towards the completion of tasks (cf. Yang et al. 2015). Conklin (2005) argues that the process of formulating a problem contributes to higher levels of cohesiveness around potential solutions, and likewise cohesiveness around the problem-space is refined through the formulation of potential solutions.

Team Conflict

Conflict has also been identified as an inherent feature of distributed ISD teams (O'Leary and Mortensen 2010; Windeler et al. 2015). Conflict can be defined as the extent to which team members diverge in their shared understanding of and shared commitment to project tasks (Carte and Chidambaram 2004; Van

den Bossche et al. 2011). Literature suggests that the impact of conflict on team effectiveness varies according to whether conflict is task-based or social in nature (Carte and Chidambaram 2004; Windeler et al. 2015). Task conflict (also known as constructive conflict) is generally seen as beneficial in moderation as it allows individuals to voice underlying divergences between their perspectives and interpretations of tasks through argumentation and clarification (Robey et al. 1993; Van den Bossche et al. 2011). While team cohesion is recognised as an important determinant of team performance, McAvoy and Butler (2009) suggest that excessive levels of cohesion can impede the performance of agile software development project teams, above all when the drive for consensus suppresses disagreement and the appraisal of alternatives. Task conflict aims to challenge team members' pre-existing assumptions and dispositions. In addition, task conflict can also foster creativity where specialists from diverse disciplinary and organisational backgrounds seek to capitalise on divergent knowledge flows and overcome the knowledge gap of any one individual.

In contrast, social conflict is generally seen to have a negative impact on team performance (Kankanhalli et al. 2006; Windeler et al. 2015). For instance, literature on social conflict (commonly referred to as destructive conflict) suggests that excessive levels of social conflict can impede team performance where it breeds negative feelings and resentment between team members (Carte and Chidambaram 2004; Montoya-Weiss et al. 2001). Team members from distributed professional and organisational backgrounds typically come with a multitude of different perspectives, ideas, and knowledge which can make collaboration difficult. For instance, McCarthy et al. (2018a) point towards the emergence of destructive conflict in a distributed ISD project team consisting of participants from numerous disciplinary backgrounds including developers, an analyst, a project manager, and healthcare practitioners. Chidambaram et al. (1990) assert that while conflict is essential to group development, team effectiveness hinges on dealing with conflict productively while still maintaining a divergence of opinions. However, there remains a dearth of literature on the paradoxical relationship between cohesion and conflict in distributed ISD project teams.

Research Design

An ethnographic approach (cf. Myers 1999; Van Maanen 1988) was chosen to study the information-rich case of a distributed ISD project called "Athena". Ethnography was selected as the most appropriate research design as it allowed the lead author to exploit his unique position as a full-time member of the project team. The author was in turn able to gain first-hand insights into the plurality of motivations, intentions, and understandings of individuals, and create 'thick descriptions' of the cultural context by building empathy with subjects (Myers 1999). The project in question was a collaborative effort between an insurance company and IS research centre based within a national university. The funding structure consisted of 20% cash and 15% benefit-in-kind contribution from the insurance company, and 65% cash contribution from a national funding body. The national funding programme aimed to stimulate the development of new knowledge, products, processes, and services by encouraging collaboration between research centres and companies with a national operating base. At the time of this ethnography study, national universities were under increasing pressure to secure financial contributions from industry in order to support the sustainability of their research centres. Academic and industry collaboration projects in the IT sector were particularly prevalent at the time due to the numerous co-funding opportunities available. The co-fund model stipulated that the academic partner would generate research publications from the project while the industry partner would develop a commercialisation plan.

The funding scheme sought to develop "mutually beneficial" outcomes for both partners. This included the development of IT solutions which would allow the insurance company to remotely deliver technology-enabled services in a foreign market; for instance, the team sought to develop technologies which would support offshore claims processing, and IT enabled insurance services for ex-patriates. In addition, the academic partner was expected to publish research findings in academic journals and conferences. The project proposal also noted that the IS research centre would accumulate knowledge which could serve the basis of teaching material in the form of case studies. The project team was distributed across different geographic locations and organisational settings; team members utilised email, conference calls, and file sharing platforms to collaborate, share knowledge, and communicate during the duration of the project. In addition, face-to-face meetings were scheduled on an intermittent basis and attended by all team members.

Data Collection and Data Analysis

The ethnographic study focuses on the longitudinal 15-month timeframe, between September 2013 and December 2014, during which time the lead author was an active member of the project team and was present in the field for five days a week, eight hours a day, from Monday to Friday. A high-level timeline of key events in the Athena project is illustrated in Figure 1. Data from the ethnographic study was triangulated from three different sources to increase the robustness of findings: participant observations, interviews, and project documents (cf. Miles and Huberman 1994). Participant observations were recorded in field notes by the lead author. This data was complemented by five semi-structured interviews with members of the team between August 2017 and October 2017: The Principal Investigator (PI), co-PI, analyst, innovation lead, and project manager, with each interview lasting between 45 and 60 minutes. The interviews were recorded and then transcribed. Finally, project documents, meeting minutes, and emails between team members were used to unearth further insights. Analysis focused on the actions and interactions between team members within the field of practice (cf. Bourdieu 1977; Faulkner and Runde 2013). This refers to the situated and temporal nexus of action where individuals interact and engage in discussions, negotiations, and conflicts.

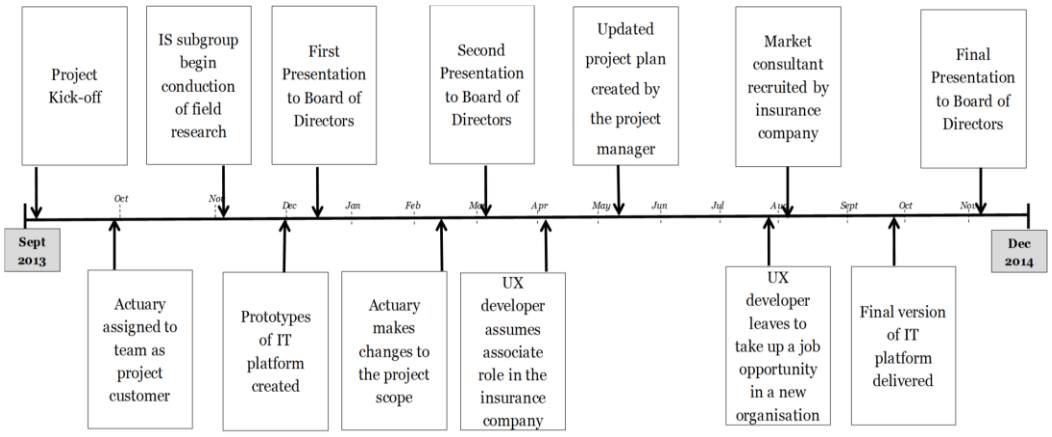


Figure 1. Timeline of Key Events in the Athena Project

The authors developed an evolving theoretical framework which set out the initial research themes; these themes were then iteratively reviewed and refined during the research process through reflection and analysis of collected data (cf. Carroll and Swatman 2000). The lead author analysed ethnographic study data using two primary techniques: coding and vignettes. Open, axial, and selective coding, as per Strauss and Corbin (1990) and Miles and Huberman (1994), were used to analyse the transcribed interview data. Open coding was used to identify new concepts related to team cohesion and conflict, and their associated properties and dimensions. Axial coding was used to form relationships between codes through inductive and deductive reasoning. Finally, selective coding involved the adoption of a core category to form a storyline around the research. Vignettes as per Miles and Huberman (1994) were used to produce, reflect on, and learn from participant observation data, and were analytically subdivided based on temporal (i.e. project phases) and spatial (i.e. venues) dimensions (cf. Miles and Huberman 1994). In addition, the lead author met weekly with the second author to recount his observations and make sense of the findings. During these meetings, which typically lasted between one and two hours, the second author would ask the lead author a series of questions about the data in order to extract potentially relevant themes. These interactions helped guide the lead author's ongoing analysis.

Theoretical Framework

In order to investigate the aforementioned research question, the authors developed a theoretical framework which aims to assist in describing and explaining how the interplay between macro-level and micro-level factors impacts cohesion and conflict in distributed ISD project teams. Macro-level factors relate to those large-scale social patterns and trends which shape individual behaviours, whereas micro-

level factors concern the study of social interactions among individuals in the field (McCarthy et al. 2017; McCarthy et al. 2018a; Sarker and Sahay 2003). The term 'interplay' refers to the reciprocal relationship between the two dimensions which exist at different levels of analysis i.e. macro and micro. Theory building was undertaken following the structured-case approach (cf. Carroll and Swatman 2000, pg. 236) which consists of "constructing and articulating a preliminary conceptual structure, collecting and analysing data, and reflecting on the outcomes to build knowledge and theory". Our theoretical development takes the form of a framework which is grounded in empirical findings and existing literature, including the seminal works of Parsons (1951; 1964) and Bourdieu (1977; 1990).

The theoretical framework aims to provide novel insights into how the interplay between macro- and micro-level factors shape the conduct of the distributed ISD projects, and in turn how this interplay impacts cohesion and conflict. Studying this interplay helps us to understand how micro-level interactions create patterns which eventually become established as macro-level constructs overtime, and how these macro-level constructs in turn shape and constrain human action at the micro-level. Following Latour (2007), we challenge prior conceptualisations of the social world as something constant and absolute, and instead assert that the social world is constantly in flux based on the continuous interplay between the macro-level context and micro-level interactions. Insights provided by our framework overcome the limitations of a strict 'dualist perspective' which investigates the macro- or micro-level in isolation.

Building on the works on Parsons (1951, 1964), our framework looks at interactions among individuals through the lens of three macro-level factors: *Structure*, *Identity*, and *Culture,* each of which can relate to subgroups within the project team, the wider project team, or the organisation in which a team member belongs to. *Structure* deals with the different positions, roles, and rules which shape how team members take action to pursue goals across situations. *Identity* deals with the different interests of team members which motivate their engagement in situations and courses of action. Finally, *Culture* refers to the different shared meanings, values, and assumptions which are internalised by team members overtime.

Our review of literature on distributed ISD project teams points to the relevancy of these three macro-level factors. For instance, Sarker and Sahay (2003) have previously suggested that structure effects the degree of dependency, control and intimacy between the members of a distributed ISD team. Carter and Grover (2015) have suggested that an individual's identity is often intertwined with IT artefacts and technology can become central to how individuals express, maintain, and expand self-concepts. Meanwhile, Kankanhalli et al. (2006) assert that cultural diversity in distributed ISD teams can contribute to higher levels of task conflict which improve team performance, specifically in relation to complex tasks.

Building on the works of Bourdieu (1977, 1990), we next turn attention towards the localised micro-level factors which shape social interactions among individuals: *Goals*, *Approach*, and *Means,* each of which can relate to different groups such as a subgroup within the project team, the wider project team, or the organisation in which a team member belongs to. *Goals* deal with the intended course of action which will be pursued by individuals in the field of practice, and which in turn shapes their decisions and utilisation of resources in the field. *Approach* refers to the 'modus operandi' of how individuals achieve goals which is guided by the tacit knowledge acquired through their accumulated experience in practice (Bourdieu 1990; Nettleton et al. 2008). *Means* refer to the resources or forms of capital which are utilised by individuals to pursue goals in the field.

We view the works of Parsons and Bourdieu as complementary as Bourdieu (1977) makes direct reference to the works of Parsons when describing how the perceived dualism between macro-level and micro-level can be reconciled. Our theoretical framework builds on this insight to investigate how differences in structure, identity, and culture interplay with the goals, approaches, and means of subgroups in localised practice. Table 1 draws on these constructs to investigate how the *interplay* between macro-level and micro-level factors impacts cohesion and conflict *between* subgroup members.

	Structure	*Identity*	*Culture*
Goals	Examines how the interplay of structure (e.g. hierarchy) and goals (e.g. IT development) impacts cohesion and conflict between subgroup members.	Examines how the interplay of identity (e.g. interests) and goals (e.g. IT development) impacts cohesion and conflict between subgroup members.	Examines how the interplay of culture (e.g. assumptions) and goals (e.g. IT development) impacts cohesion and conflict between subgroup members.

Approaches	Examines how the interplay of structure (e.g. hierarchy) and approaches (e.g. project plans) impacts cohesion and conflict between subgroup members.	Examines how the interplay of identity (e.g. interests) and approaches (e.g. project plans) impacts cohesion and conflict between subgroup members.	Examines how the interplay of culture (e.g. assumptions) and approaches (e.g. project plans) impacts cohesion and conflict between subgroup members.
Means	Examines how the interplay of structure (e.g. hierarchy) and means (e.g. capabilities) impacts cohesion and conflict between subgroup members.	Examines how the interplay of identity (e.g. interests) and means (e.g. team capabilities) impacts cohesion and conflict between subgroup members.	Examines how the interplay of culture (e.g. assumptions) and means (e.g. team capabilities) impacts cohesion and conflict between subgroup members.

Table 1. The Typology for Organizational ISD Practice

The conceptual diagram shown in Figure 2 illustrates this interplay between macro-level factors (Structure, Identity, and Culture), and micro-level factors (Goals, Approaches, and Means). Pragmatically, the interplay between these two dimensions represents how collective patterns (macro-level) influences the individual interactions (micro-level) and vice versa during the conduct of ISD. Thanks to the insight explicating this provides, we were able to better explain cohesion and conflict in distributed ISD teams. The next section outlines findings from the ethnographic study.

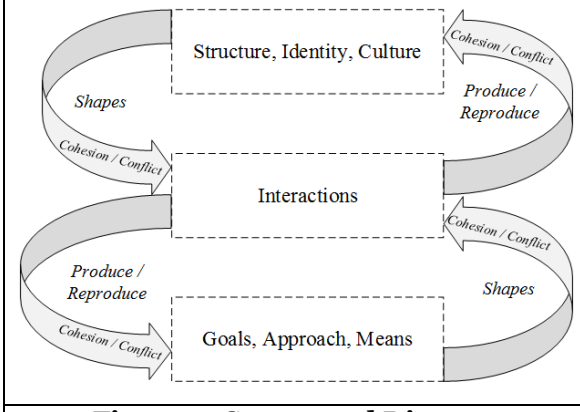


Figure 2. Conceptual Diagram

Findings

The distributed ISD project team consisted of individuals from multiple organisational and disciplinary backgrounds including insurance professionals in a national insurance company, and academic and research staff in an Information Systems (IS) research centre. Two subgroups emerged through participant observations and interviews with members of the project team: the 'industry subgroup' which consisted of an actuary, innovation lead, and project manager in the insurance company, and 'IS subgroup' which consisted of a Principal Investigator (PI), co-PI, User Experience (UX) developer, and three analysts in the IS research centre.

The remainder of this section outlines how the interplay between the macro- and micro-level factors impacted team cohesion and conflict between subgroups. Each cell of the theoretical framework is used to examine a different manifestation of this interplay and how it shaped group development in the Athena project. The remaining subsections are grouped by macro-level factors (i.e. Structure, Identity, Culture), and their interplay with each micro-level factor (i.e. Goals, Approaches, Means) in turn. This grouping choice was arbitrary and does not denote the relative importance of either macro- or micro-level factors.

The Interplay between Structure and Micro-Level Factors

1) Emerging Hierarchies and Goals in the Project Team (Structure – Goals)

The interplay between structure and goals: While the PI and innovation lead were initially at the apex of the project team's hierarchical structure, the actuary quickly assumed the de-facto role of primary decision maker following his assignment to the team. As a result, the actuary began to override previous goals set by the PI and innovation lead during team interactions. For instance, the actuary utilised meetings between the distributed team as a way to challenge the initial hierarchy and changed the project's goals considerably to include a number of new technological areas which the IS subgroup would need to investigate. As stated by one analyst: "*he would have cleared stuff off the board as a non-runner pretty quickly without even having a detailed look at the topic… he was able to very quickly say that 'yes that's a potential runner', or 'no that's way beyond what we can do"*. The actuary began to increasingly structure the work that the IS subgroup should undertake. In order to maintain a good relationship with the insurance company, the PI and co-PI agreed to follow the emerging goals set out by the industry subgroup, and instructed the analysts and UX developer to meet their demands.

The impact of this interplay on cohesion and conflict: While the actuary's de-facto role helped generate cohesion around the commercially-oriented goals of the insurance company, it limited the IS subgroup's ability to engage in task conflict and pursue academic-oriented goals which were of primary relevance to the IS subgroup. For instance, the resulting project plan developed by the project manager did not make reference to the delivery of any academic outputs by the IS subgroup such as publications and consequently, the IS subgroup found it difficult to discern potential academic contributions at the end of the project. The co-PI later acknowledged that the IS subgroup were constrained in their ability to realise mutually beneficial outcomes as the insurance company primarily stood to benefit from the project plan: "*we don't bring heavy hitting theory to these types of projects, we bring a lot of common sense and know-how in terms of how to manage good relationships with our funders… and making sure that there is a meaningful outcome. And that may not necessarily be an academic output"*.

2) Tension in the Project Management Relationship (Structure – Approaches)

The interplay between structure and approaches: It became clear to the IS subgroup early in the project that the industry subgroup wished to pursue a very structured 'top down' approach to project management which included tightly controlled task allocations with hard deadlines for completion. In contrast, the IS subgroup were more accustomed to a loosely structured 'bottom up' approach in which the analysts and UX developer were conferred with more autonomy over their task allocations. However, the IS subgroup's bottom up approach made the industry subgroup uneasy as they perceived inherent risks associated with this approach. As stated by the innovation lead: "*the resources that we have assigned here internally to work on (Athena) is a cost to the business… we need structure; from a research perspective, maybe a loose plan, but still a plan*". The project manager was therefore recruited to enact a top down approach to managing the distributed team and improving cohesiveness by coordinating the IS subgroup's work through email and conference calls. Once recruited, the project manager set out to deliver a project plan in collaboration with the innovation lead which detailed a clear assignment of task allocations based on a set scope and timeline.

The impact of this interplay on cohesion and conflict: This structured top down approach later led to social conflict as the IS subgroup felt that the project manager did not fully appreciate the inherent challenges that the IS subgroup faced in completing their allocated work. The IS subgroup became frustrated by the project manager's repeated emails which demanded the completion of challenging work tasks. While the PI tried to push back on these demands on a number of occasions, tension in the project management relationship still remained. As stated by the co-PI: "*(the project manager) didn't understand or really appreciate that research and development can be a bit vague at times. The outcome may not always be expected and that living with a little bit of uncertainty in research is what we do every day*". In particular, the analysts encountered uncertainties around the research scope given that exploration was a key part of the original approach detailed in the proposal. The analyst commented on the uncertainties that the IS subgroup faced in defining the scope of research: "*I guess the nature of research is not something that you can necessarily tie down tight… (but) they ran a very tight ship when it came to project management which would have been relatively newer for us*".

3) Structural Changes to Team Capabilities (Structure – Means)

The interplay between structure and means: Structural changes to the team were made overtime, with new team members brought in to expand the means available within the Athena project. For instance, the project manager was recruited a few months into the project to work full-time on Athena and closely monitor the work of the distributed team. The decision was surprising as the co-PI had already assumed the role of project manager in the IS research centre, and in effect this created two project management roles. As stated by the insurance company's project manager: "*My role was to be the project manager from the insurance company's side and so I would be liaising with the team in the IS research centre on a regular basis. The IS research centre obviously had their own project manager so I would be liaising with her as well*". On paper, the co-PI seemed better suited to assume the responsibility of monitoring the IS subgroup's work as the project manager had limited experience of managing ISD projects or research teams. Nevertheless, the industry subgroup felt the project manager's skills in project management would help generate cohesion around the means of practice and ensure that the IS subgroup's capabilities would be better employed for the duration of the project.

The impact of this interplay on cohesion and conflict: The assignment of two team members with project management responsibilities eventually led to social conflict as structural reporting relationships between the project manager, the analyst and UX developer had not been formally defined. The project manager had hoped that the IS subgroup would report directly to her and the co-PI by email on all project matters as a first port of call; however, in practice the UX developer and analysts reported to the co-PI first and felt less of an obligation to communicate with the project manager once the co-PI's clearance had been given. Moreover, this restructuring of the team may have pointed towards a lack of task cohesion and trust in the IS subgroup's capabilities to deliver on the project proposal unaided. Issues of trust in the team's capabilities seemed to develop from the industry subgroup's perception that the IS subgroup, while highly competent in developing prototype IT artefacts and assimilating data from field research, lacked the commercial knowledge to deliver real organisational change. The innovation lead commented that in the event that the two partners would collaborate again, she would envision a very lean scope of involvement for the IS research centre where: "*the research institute (would) take a more minor role… I think ye could play a role, but not to the extent of the role you played in (the Athena project)*".

The Interplay Between Identity and Micro-Level Factors

4) Conflicting Professional Interests around Project Success Criteria (Identity – Goals)

The interplay between identity and goals: At the end of the Athena project, the distributed ISD team achieved the goals of delivering outputs on time, within budget, and to the pre-defined project scope. However, team members still perceived success in different ways based on their identity related interests. For instance, the PI asserted that the Athena project represented one of the most successful projects he had been part of, and noted his aspirational goal to engage in projects like Athena again in the future: "*Athena is really the architype of the kind of projects that I would like to be involved in… For me it remains a model for the kind of work I would like to do in the future*". This aligned with his professional interests in securing ample amounts of research funding and maintaining a strong relationship with the insurance company. Similarly, the project manager indicated that Athena had been successful based on standard project management KPIs having been met such as the delivery of outcomes on time, within budget, and to scope. This perception of success was tied to the interests and goals related to her professional identity as a project manager. However, other team members harboured different views on project success based on their conflicting professional identities and goals. In particular, the analysts and co-PI were primarily interested in research output, mainly in the form of journal and conference papers.

The impact of this interplay on cohesion and conflict: Social conflict arose as team members were not provided with a forum to voice alternative views on project success, and instead these differences remained implicit. In particular, social conflict later emerged due to differences between the professional identities and career goals of the distributed ISD team. For instance, the analysts stood to benefit most from learning the craft of writing academic papers and developing a publication track record. However, the publication of research was deferred as a comparatively less important goal during the Athena project in order to maintain a strong relationship with the insurance company. The co-PI noted that in the end, the project had not fully delivered on academic goals set out in the proposal around research output:

"*Would I do (it again)? It's a tough one. For these kind of projects, you have to go into them recognising that there may not be a huge amount of academic, publishable output*".

5) Differing Interests in Project Management Approach (Identity – Approaches)

The interplay between identity and approaches: The industry subgroup was held personally accountable in the insurance company for the final project outcome which motivated their professional interest in micro-managing the IS subgroup's approach to work. The innovation lead and project manager sought to ring-fence the work that would be carried out by the IS subgroup through the creation of a detailed project plan and Gantt chart. This regimented approach to project management was seen as essential to generate cohesion and ensure that the insurance company would minimise risks associated with their financial contributions. As stated by the innovation lead: "*from a research perspective I might have struggled a bit with… trying to put a bit of structure around (the project) and figuring out what's the scope of the piece of work we're doing… Cause from a commercial perspective we can't run projects indefinitely*". The project manager similarly pointed towards the importance of project management as a safeguard to generate cohesiveness given the diverse backgrounds of team members. For instance, the project manager noted her interest in enacting an approach that tightly controlled all tasks undertaken by the distributed team using a protocol of detailed descriptions of work with hard deadlines for completion.

The impact of this interplay on cohesion and conflict: Nevertheless, social conflict began to emerge overtime as the industry subgroup continued to push for cohesion despite underlying tensions with the IS subgroup's identity-related interests. For instance, unlike the industry subgroup, the IS subgroup were less concerned by perceived uncertainties around the project scope and timelines for the completion of project work. The IS subgroup were instead more interested in adopting a laissez-faire approach to project management which provided increase flexibility through short-term planning and ad hoc decision making. In particular, a laissez faire approach to project management was more compatible with the IS subgroup's collective interests in 'blue sky thinking' and the investigation of leading edge technologies. The PI alluded to this when commenting on the interests of the UX developer: "*he (wanted) to play this very disruptive role … (the insurance company) prided themselves to be able to accelerate to a six-month (software development) cycle. And he was laughing and said to them 'how about two weeks?'*". Social conflict emerged as the IS subgroup felt the industry subgroup's intolerance for uncertainty conflicted with their collective identity-related interest to engage in 'blue sky thinking'. However, while the innovation lead recognised this social conflict, she remained adamant that such an approach would not be appropriate in the Athena project given the commercial demands faced by the insurance company.

6) Nomadic Identities within the Project Team (Identity – Means)

The interplay between identity and means: Team members' professional identities at times did not align with their collective identity in the distributed team which in turn led to certain team members becoming more nomadic overtime. In particular, the UX developer's identity in the project team seemed to be in conflict with his professional identity which eventually created uncertainty around the means. The UX developer was keen to personally maintain this autonomy and to differentiate himself from other team members in the IS research centre as he wished to pursue a career in industry going forward. For instance, the UX developer was the only member of the IS researcher subgroup that did not wish to adopt a IS research centre email account or acknowledge the centre in his email signature. Commenting on this, the PI noted that: "*first of all there is the individual and their preferences… I managed to have a narrative about him and about his role in the project which allowed people to relax about his contribution and take it in terms of what path he had to travel*". As a result of this autonomy, the UX developer's professional identity in the project became more nomadic and uncertain overtime. For instance, midway through the project, the UX developer agreed with the PI to assume the associate role of "IT Technical Architect in Software Development" within the insurance company and relocate to an open plan office based on the insurance company's premises. This in turn altered the means of ISD practice in the Athena project and shaped the interactions between team members.

The impact of this interplay on cohesion and conflict: Following this transition, the analysts' level of interactions with the UX developer decreased significantly and cohesion suffered. Despite the interdependencies between their tasks, the analyst began to decouple their work from the UX developer due to uncertainties around the means available to the IS subgroup. The analysts increasingly saw the UX

developer's professional identity as residing with the insurance company, and therefore they no longer reached out to him to request the completion of tasks. Nevertheless, the UX developer felt less sure-footed about his identity in the distributed team. While the PI and co-PI still expected the UX developer to fulfil obligations associated with the Athena project and IS research centre, the project manager also increasingly began to manage the UX developer as an internal resource and contacted him regularly by email to ask for updates on his work. This became a source of social conflict for the UX developer given his preference for autonomy. The UX developer struggled to integrate into the insurance company's IT team, yet despite this, the innovation lead felt that "*he wasn't a person that needed to be taken care of too closely*" as she felt that he could be trusted "*to get on with things himself*".

The Interplay Between Culture and Micro-Level Factors

7) Clashing Assumptions Around Project Goals (Culture – Goals)

The interplay between culture and goals: The PI noted that the industry subgroup came with cultural assumptions around the ISD project's goals which did not always reflect the IS subgroup's view of reality. For instance, at the start of the project, the PI noted that the industry subgroup had expected the IS subgroup to conduct work more akin to management consultancy or market research, whereas the PI remained adamant that the IS subgroup would only engage in Research and Development (R&D) and innovation. As a result, the PI tried to generate cohesion by continually reiterating the IS subgroup's goals in the project, as the funding programme rules prohibited the conduction of market research and consultancy activities: "*it is true that at times I went out explaining what a research project was from an academic viewpoint and they tried to counter in terms of what a research project was from their viewpoint. Where actually what they were interested in was market research*". However, despite the PI's efforts, the industry subgroups assumptions around the project goals still remained. For instance, the industry subgroup often emailed to request the completion of tasks that could be labelled as market research, such as the conduction of surveys to gather data on existing customers and an analysis of existing competitors in the market. While the PI and co-PI eventually conceded to survey a sample of customers to better inform the artefact design, they refused to provide market recommendations at the end of the project as requested by the industry subgroup.

The impact of this interplay on cohesion and conflict: As a result of this interplay, task conflict emerged around each partner's involvement in achieving project goals. One analyst conceded that while it proved difficult for the IS subgroup to achieve the goals, task conflict did help generate cohesion around the industry subgroup's values: "*at times it was little too much as it was something we weren't used to, (but) it did result in number one, the ability of the company to change their targets and number two for us to be in line with the targets. As I say you might look to cool it off a little bit*". Having said that, the level of task cohesion around mutually beneficial goal was still limited. This later led to social conflict between the IS subgroup and industry subgroup, as sometimes the industry subgroup demanded the completion of project work beyond the scope of the project proposal. Although not explicitly outlined in the Athena project proposal, the PI justified these demands based on the insurance company's financial contribution. This occasionally led to social conflict as the analysts did not share the PI's view.

8) Tension Between Subgroup Values and Approaches (Culture – Approaches)

The interplay between culture and approaches: The industry subgroup placed high cultural value on the conduct of field research to investigate the technical viability of IS prototypes. This required the analysts to undertake interviews and surveys with key stakeholders in the foreign market, such as potential users and experts. However, the terms of agreement were that the insurance company would remain as an anonymous partner throughout the conduction of field research, and the IS subgroup would maintain a signed non-disclosure agreement (NDA) which prevented the IS subgroup from revealing the insurance company's potential plans to launch IT solutions in the foreign market. In addition, the IS subgroup faced cultural pressures to abide by the universities ethical guidelines which aimed to ensure transparency and accountability in their research. The IS subgroup agreed with the industry subgroup that they would deliver only aggregated and anonymised findings to the industry subgroup in order to uphold ethical guidelines. Based on these agreements, the PI and co-PI were confident that their approach to the field research was defensible from an ethical and NDA point of view and therefore they indicated that the IS subgroup should proceed to engage with stakeholders in the foreign market.

The impact of this interplay on cohesion and conflict: The industry subgroup indicated that field research should begin without delay and as a result, cohesion around the approach was prioritised to ensure that the IS subgroup could begin. However, misalignments between academic and commercial values and unanticipated risks around the approach soon emerged due to the absence of task conflict. For instance, the stakeholders contacted by the IS subgroup increasingly demanded to know the name of the industry partner involved in the project which put pressure on the IS subgroup to disclose who was involved in the project. Equally the industry subgroup placed mounting pressure on the IS subgroup to gain a significant sample of responses from field research. Misalignments between academic and commercial values came to a fore when the director of an independent organisation agreed to distribute the IS subgroup's survey through his network. However, despite his initial openness, the director later expressed concern that the involvement of a commercial partner in the Athena project could be seen to compromise his independence. This interaction provoked a detailed and comprehensive reply from the PI and in response, the PI stated that while the project had been co-funded by contributions from a public funding body and an industry partner, he reiterated that "*this does not have any bearing on our independence as a research centre*". However, future conversations with industry experts were carefully coordinated by the PI and co-PI, and in-depth desk research began to be prioritised as the main course of action.

9) Misalignment Between Expectations and Team Capabilities (Culture – Means)

The interplay between culture and means: The insurance company's involvement in the project had been motivated based on the cultural assumption that the IS subgroup had the means to derive key findings on customers and competitors in the foreign market through field research which would in turn inform the design of the proposed IT artefact. In particular, this assumption developed from conversations that the industry subgroup had with the PI earlier in the project. However, in practice, the IS subgroup faced significant challenges in gathering responses from stakeholders through field research, mainly due to the uncertainties expressed by stakeholders around the involvement of an unnamed industry partner. The PI increasingly recognised that there were misalignments between what the industry subgroup hoped the IS subgroup could achieve and the means they had available. In particular, the PI indicated these misalignments primarily concerned the IS subgroup's lack of prior commercial expertise in the foreign market: "*We knew absolutely nothing about the (market) landscape (but) we knew the technologies. It's tough the way we came at it… I mean this was (like) walking the tightrope, and at times I really felt it. Intellectually I thought we were at the outer edge of what we could actually do. And I think it's a characteristic of these projects*".

The impact of this interplay on cohesion and conflict: Misalignments between culture and means eventually led to task conflict between the IS subgroup and industry partner. While the industry subgroup had indicated that the IS subgroup's input had been valuable, the findings did not always provide answers to the key questions that the industry subgroup had in relation to various market conditions and parameters. In particular, collating the niche pieces of information requested by the industry subgroup through desk research proved near impossible for the IS subgroup given its commercially sensitive nature of some data, as stated by one analyst: "*it's one thing to sit at a desk and look at things online and (it's another to) talk to people involved in the (foreign market). It's very difficult to get a full understanding of the actual full market landscape*". The industry subgroup eventually decided to engage with a market consultant towards the end of the project to validate the IS subgroup's work and generate cohesion around the findings gathered to date. However, the industry subgroup did not invite the analysts and UX developer to the first meeting with the market consultant which created social conflict. This decision to exclude the analysts and UX developer from the meeting in turn reduced the level of team cohesion and pointed towards a deepening chasm between the subgroups.

Discussion

Findings derived from the application of our theoretical framework highlight how the interplay between macro- and micro-level factors impacts cohesion and conflict between subgroups. In particular, we examine how the interplay between structure, identity, culture, and goals, approaches, means shapes the paradox of cohesion and conflict in distributed ISD teams. Investigating the interplay between these macro and micro level factors provides insights into how localised interactions create patterns which eventually become established as macro-level constructs, and how these macro-level constructs in turn

then shape and constrain human action at the micro-level. This in turn can helps us to understand how paradoxical tensions emerge, change, and reproduce overtime (Fairhurst et al. 2016). However, extant literature on distributed ISD teams to date has primarily focused on either micro-level processes of interactions between team members, or macro-level aspects of the environmental context and team formation which persist over time (Sarker et al. 2009; Sarker and Sahay 2003). This dualist perspective overlooks the reciprocal relationship between both micro-level interactions and macro-level context.

Table 2 summarises the findings using the theoretical framework described in section 3. The cells of the framework are interrelated rather than independent and therefore cells entries at time overlap.

	Structure	*Identity*	*Culture*
Goals	1) Emerging hierarchies and goals in the project team promoted cohesion over task conflict, which eventually lead to social conflict.	4) Conflicting professional interests on project success criteria lead to social conflict as the drive for cohesion impeded task conflict.	7) Clashing assumptions around project goals lead to social conflict as the drive for cohesion impeded task conflict.
Approaches	2) Tensions in the project management relationship promoted cohesion over task conflict, which eventually lead to social conflict.	5) Differing interests in project management approach promoted cohesion over task conflict, which eventually lead to social conflict.	8) Tension between subgroup values and approaches lead to social conflict as the drive for cohesion impeded task conflict.
Means	3) Structural changes to team capabilities promoted cohesion over task conflict, which eventually lead to social conflict.	6) Nomadic identities within the project team eventually lead to social conflict as the drive for cohesion impeded task conflict.	9) Misalignment between expectations and capabilities lead to social conflict as the drive for cohesion impeded task conflict.

Table 2. Typology for Organisational ISD Practice Findings

The industry subgroup's continuous drive for cohesion aimed to mitigate differences in structure, identity, and culture across the subgroups; however, in turn this drive for cohesion limited the IS subgroup's ability to engage in task conflict around the goals, approaches, and means of practice. As a result, cohesion was siloed to the commercial ambitions of the insurance company, with comparatively less attention directed towards more mutually beneficial outcomes and the academic ambitions of the IS subgroup. This later led to the emergence of social conflict as members of the IS researcher subgroup felt that they were at the whim of the industry subgroup and were constrained in their ability to challenge the industry subgroup's decisions. The PI's decision to acquiesce to the industry subgroup's demands in order to maintain the relationship consequently meant that the analysts and UX developer were provided with limited opportunities to discuss alternative perspectives around goals, approaches and means of the practice.

The findings presented in this paper aligns with an alcove of literature that suggests excessive levels of task cohesion can have negative implications unless balanced by sufficient amounts of task conflict (Chidambaram et al. 1990; McAvoy and Butler 2009). The assumption that cohesion is always positive in distributed ISD teams, as posited by authors such as Garrison et al. (2010), therefore may be misguided as based on our empirical findings we observe that it fails to account for the importance of task-based conflict in addressing issues of diversity within distributed ISD teams. This also suggest that cohesion can be a 'double edged sword': while task and social cohesion is essential to build shared understanding and shared commitment between team members, excessive levels of cohesion can impede group development as task conflict is equally essential to negotiate differences. For instance, task conflict is important for mitigating the differences between the diverse positions (i.e. structure), interests (i.e. identity), and meanings (i.e. culture) of distributed team members.

In addition, contrary to extant literature, the findings also point towards instances where excessive levels of cohesion can even contribute to social conflict between subgroups when the level of task conflict is constrained. In particular, social conflict can emerge where one subgroup seeks to maximise cohesion by aligning all team members to their positions, interests, and meanings, and limit the opportunities for

others to challenge decisions. Literature rarely differentiates between cohesion that emerges from task-based conflict between individuals involved in the ISD project, and cohesion which is imposed by one subgroup over the other by assuming control of substantive mechanisms such as a project plan. The findings suggest that differentiating between these two forms of cohesion can further explain the potential emergence of social conflict between subgroups.

However, this is not to suggest that task conflict is a panacea for all challenges faced by distributed ISD teams. On the contrary, high levels of task conflict can equally constrain team performance and potentially derail a project, unless balanced by efforts to negotiate differences and restore cohesion. For instance, in the Athena project, cohesion was still pivotal to ensuring that the project was delivered on time, within budget, and to a pre-defined scope. However, a broader definition of project success beyond the 'iron triangle' of time, budget, and scope (cf. McLeod et al. 2012) reveals limitations to this approach. For instance, the Athena project failed to deliver academic output in the form of publications, and the business plan developed by the insurance company became increasingly conservative overtime. In addition, the absence of task conflict eventually led to social conflict as a chasm began to open up between the subgroups when members of the IS researcher felt limited in their ability to air differences of opinion.

The findings therefore point towards the paradoxical need for both cohesion and conflict in distributed ISD teams. Project managers are faced with the challenge of balancing the contradictory demand for both convergent knowledge (cohesion) and divergent knowledge (conflict) around the task. Managing this paradox will at times require a project manager to foster the role of 'devil's advocate' (cf. McAvoy and Butler 2009) in order to challenge the emergence of excessive cohesion, while at other times it will require the project manager to assume the role of monitor and coordinator in order to ensure that the team progresses with the completion of tasks (cf. Wakefield et al. 2008). This may run contrary to the logic of project managers who view cohesion as the ultimate aim of group decision-making. However, project managers must aim to understand the entangled relationship between cohesion and conflict to ensure they are able to counterbalance each: accentuating the positives of cohesion and conflict while mitigating pitfalls of excessive cohesion and conflict though adaptive management.

The role of devil's advocate is not necessarily the sole remit of the project manager, and the role can also be delegated to other team members who possesses the skills needed to fulfil this role i.e. the ability to challenge the assumptions of other team members through critical thinking and task-based conflict. This can help stimulate more creative ideas, clarify ambiguities and reveal alternative perspectives (McAvoy and Butler 2009). However, project managers must also put mechanisms in place to ensure that conflict is balanced by efforts aimed at generating cohesion and resolving episodes of conflict effectively. For instance, Wakefield et al. (2008) suggest that maintaining internal or intra-group stability in distributed teams requires leaders to adopt the roles of 'monitor' and 'coordinator'; the role of coordinator aims to build and maintain stability by setting rules and standards, while the role of monitor aims to oversee performance progress, and ensure continuity between the discrete tasks of team members. Wakefield et al. (2008) also suggest that depending on the context, leaders equally need to allow team members to express diverse opinions, before seeking consensus between these divergent views (i.e. facilitator), as well as actively listening to the needs of team members and supporting their requests (i.e. mentor).

Therefore, effective leadership requires project managers to adopt different roles depending on the situation at hand and the appropriate response needed. Organisational paradoxes such as cohesion and conflict cannot be solved by 'splitting and choosing' one over the other, and instead both phenomena must co-exist (Fairhurst et al. 2016). At times there may be inherent tensions between the two when team members must walk a tightrope between excessive levels of cohesion and excessive levels of conflict. This tension may only be felt when distributed team members are tasked with driving both alignment (i.e. where team members follow established procedures to achieve common goals) and adaptability (i.e. where team members reconfigure processes to quickly meet changing demands in the task environment) during the software development process (cf. Ramesh et al. 2012). When faced with this challenge, project managers must aim to manage both demands simultaneously and foster a virtuous cycle between cohesion and conflict (Fairhurst et al. 2016). The relationship between cohesion and conflict is best thought of as a dynamic interaction which is characterised by instability. This means that the cyclical relationship between cohesion and conflict is constantly changing based on team interactions. The next section brings the paper to a close with a conclusion.

Conclusion and Implications

In this paper we sought to theorise the interplay of factors which impact cohesion and conflict in distributed ISD projects. We presented empirical findings from the ethnographic study of the Athena project to provide insights into the inherent challenges involved in managing the paradoxical phenomena of cohesion and conflict in distributed ISD projects. In terms of theoretical contributions, this paper presents a novel theoretical framework for describing and explaining interactions between ISD project team members within distributed settings. The theoretical development aims to describe and explain how the interplay between macro (e.g. structures, identities, and cultures) and micro (e.g. goals, approaches, means) level factors impact team cohesion and conflict. For instance, the theoretical insights from the framework help structure the authors' analysis of findings from the Athena project and provide new theoretical perspectives around the emergence of cohesion and conflict in distributed ISD projects.

From a practical perspective, the paper contributes insights into the tensions faced when managing ISD projects in distributed settings which could potentially be of value to project managers, analysts, and developers. Tensions were seen to arise in unexpected ways based on the dynamic interplay between macro- and micro-level factors. For instance, the findings point towards the tensions that can emerge between subgroups with contrasting approaches to project management (*Structure – Approaches*), and when individuals have conflicting criteria for project success (*Identity – Goals*). Furthermore, nomadicity can pose challenges in distributed settings where certain team members adopt project roles that span multiple organisations (*Identity – Means*), as well as misalignment between the capabilities of a team and the expected project outcomes (*Culture – Means*). An awareness of these practical challenges is essential to ensure that team members are equipped to address features of complexity in distributed settings.

The theoretical framework could also help practitioners anticipate challenges around cohesion and conflict during the conduct of a distributed ISD project. For instance, the PI of the Athena project later indicated that the theoretical framework could have potentially helped him to detect areas of misalignment between the subgroups if it had been at hand early on in the Athena project. Applying the framework to a case could assist practitioners in taking action to mitigate emerging tensions between subgroups and improve team performance; this proposition could to be explored in future research.

One limitation of the ethnographic approach is that the findings may not be generalizable to other contexts. Future research will apply the theoretical framework to other contexts in order to further validate the underlying concepts and refine the relationships between these concepts. In addition, future research will seek to develop a set of recommendations from a cross-case analysis around how distributed ISD project managers can foster a mind-set that embraces the paradox of team cohesion and conflict. The concept of 'authenticity' (cf. Michie and Gooty 2005) will also be looked at to understand the challenges of value alignment among diverse individuals and groups within distributed settings.

Acknowledgements

This publication was financially supported by the College of Business and Law (CBL) in University College Cork, Ireland under their CBL Development Award scheme.

References

Barki, H., and Hartwick, J. 2001. "Interpersonal Conflict and Its Management in Information System Development," *Mis Quarterly*), pp. 195-228.

Bourdieu, P. 1977. *Outline of a Theory of Practice*. Cambridge university press.

Bourdieu, P. 1990. *The Logic of Practice*. Stanford University Press.

Briggs, R.O., Kolfschoten, G.L., and Vreede, G.-J.d. 2005. "Toward a Theoretical Model of Consensus Building," *AMCIS 2005 Proceedings*), p. 12.

Carroll, J.M., and Swatman, P.A. 2000. "Structured-Case: A Methodological Framework for Building Theory in Information Systems Research," *European Journal of Information Systems* (9:4), pp. 235-242.

Carte, T., and Chidambaram, L. 2004. "A Capabilities-Based Theory of Technology Deployment in Diverse Teams: Leapfrogging the Pitfalls of Diversity and Leveraging Its Potential with Collaborative Technology," *Journal of the Association for Information Systems* (5:11), p. 4.

Carter, M., and Grover, V. 2015. "Me, My Self, and I (T): Conceptualizing Information Technology Identity and Its Implications," *Mis Quarterly* (39:4).

Carton, A.M., and Cummings, J.N. 2012. "A Theory of Subgroups in Work Teams," *Academy of Management Review* (37:3), pp. 441-470.

Chidambaram, L., Bostrom, R.P., and Wynne, B.E. 1990. "A Longitudinal Study of the Impact of Group Decision Support Systems on Group Development," *Journal of Management Information Systems* (7:3), pp. 7-25.

Conchúir, E.Ó., Ågerfalk, P.J., Olsson, H.H., and Fitzgerald, B. 2009. "Global Software Development: Where Are the Benefits?," *Communications of the ACM* (52:8), pp. 127-131.

Conklin, J. 2005. *Dialogue Mapping: Building Shared Understanding of Wicked Problems*. Wiley.

Doherty, N.F., and King, M. 2005. "From Technical to Socio-Technical Change: Tackling the Human and Organizational Aspects of Systems Development Projects," *European Journal of Information Systems* (14:1), pp. 1-5.

Fairhurst, G.T., Smith, W.K., Banghart, S.G., Lewis, M.W., Putnam, L.L., Raisch, S., and Schad, J. 2016. "Diverging and Converging: Integrative Insights on a Paradox Meta-Perspective," *Academy of Management Annals* (10:1), pp. 173-182.

Faulkner, P., and Runde, J. 2013. "Technological Objects, Social Positions, and the Transformational Model of Social Activity," *Mis Quarterly* (37:3), pp. 803-818.

Garrison, G., Wakefield, R.L., Xu, X., and Kim, S.H. 2010. "Globally Distributed Teams: The Effect of Diversity on Trust, Cohesion and Individual Performance," *The DATABASE for Advances in Information Systems* (41:3), pp. 27-48.

Hummel, M., Rosenkranz, C., and Holten, R. 2016. "The Role of Shared Understanding in Distributed Scrum Development: An Empirical Analysis," *European Conference on Information Systems*, p. ResearchPaper28.

Jarvenpaa, S.L., Shaw, T.R., and Staples, D.S. 2004. "Toward Contextualized Theories of Trust: The Role of Trust in Global Virtual Teams," *Information systems research* (15:3), pp. 250-267.

Kankanhalli, A., Tan, B.C., and Wei, K.-K. 2006. "Conflict and Performance in Global Virtual Teams," *Journal of management information systems* (23:3), pp. 237-274.

Kleinsmann, M., and Valkenburg, R. 2008. "Barriers and Enablers for Creating Shared Understanding in Co-Design Projects," *Design Studies* (29:4), pp. 369-386.

Kotlarsky, J., and Oshri, I. 2005. "Social Ties, Knowledge Sharing and Successful Collaboration in Globally Distributed System Development Projects," *European Journal of Information Systems* (14:1), pp. 37-48.

Kudaravalli, S., and Faraj, S. 2011. "Knowledge Collaboration in Distributed Practice Communities," *ICIS 2011 Proceedings*.

Latour, B. 2007. "Reassembling the Social," *Hampshire: Oxford University Press*).

Lee, J., Park, J.-G., and Lee, S. 2015. "Raising Team Social Capital with Knowledge and Communication in Information Systems Development Projects," *International Journal of Project Management* (33:4), pp. 797-807.

Lim, W.-K., Sia, S.K., and Yeow, A. 2011. "Managing Risks in a Failing It Project: A Social Constructionist View," *Journal of the Association for Information Systems* (12:6), p. 374.

Luna-Reyes, L.F., Zhang, J., Gil-García, J.R., and Cresswell, A.M. 2005. "Information Systems Development as Emergent Socio-Technical Change: A Practice Approach," *European Journal of Information Systems* (14:1), pp. 93-105.

McAvoy, J., and Butler, T. 2009. "The Role of Project Management in Ineffective Decision Making within Agile Software Development Projects," *European Journal of Information Systems* (18:4), pp. 372-383.

McCarthy, S., O'Raghallaigh, P., Fitzgerald, C., and Adam, F. 2017. "A Typology for Organizational Ict Practice," in: *the 50th Hawaii International Conference on System Sciences*.

McCarthy, S., O'Raghallaigh, P., Fitzgerald, C., and Adam, F. 2018a. "Exploring the Nuances of 'Wickedness' in Information Systems Development," in: *the 51st Hawaii International Conference on System Sciences*.

McCarthy, S., O'Raghallaigh, P., Fitzgerald, C., and Adam, F. 2018b. "Social Complexity and Team Cohesion in Multiparty Information Systems Development Projects," *Journal of Decision Systems*), pp. 1-14.

McLeod, L., Doolin, B., and MacDonell, S.G. 2012. "A Perspective-Based Understanding of Project Success," *Project Management Journal* (43:5), pp. 68-86.
Michie, S., and Gooty, J. 2005. "Values, Emotions, and Authenticity: Will the Real Leader Please Stand Up?," *The Leadership Quarterly* (16:3), pp. 441-457.
Miles, M.B., and Huberman, A.M. 1994. *Qualitative Data Analysis: A Sourcebook*. Beverly Hills: Sage.
Montoya-Weiss, M.M., Massey, A.P., and Song, M. 2001. "Getting It Together: Temporal Coordination and Conflict Management in Global Virtual Teams," *Academy of management Journal* (44:6), pp. 1251-1262.
Myers, M. 1999. "Investigating Information Systems with Ethnographic Research," *Communications of the AIS* (2:4es), p. 1.
Nettleton, S., Burrows, R., and Watt, I. 2008. "Regulating Medical Bodies? The Consequences of the 'Modernisation'of the Nhs and the Disembodiment of Clinical Knowledge," *Sociology of health & illness* (30:3), pp. 333-348.
O'Leary, M.B., and Mortensen, M. 2010. "Go (Con) Figure: Subgroups, Imbalance, and Isolates in Geographically Dispersed Teams," *Organization Science* (21:1), pp. 115-131.
Parsons, T. 1951. *The Social System*. London: Routledge.
Parsons, T. 1964. *Social Structure & Personality*. The Free Press.
Pflügler, C., Wiesche, M., and Krcmar, H. 2018. "Subgroups in Agile and Traditional It Project Teams," *51st HICSS*.
Powell, A., Piccoli, G., and Ives, B. 2004. "Virtual Teams: A Review of Current Literature and Directions for Future Research," *The DATABASE for Advances in Information Systems* (35:1), pp. 6-36.
Puntambekar, S. 2006. "Analyzing Collaborative Interactions: Divergence, Shared Understanding and Construction of Knowledge," *Computers & Education* (47:3), pp. 332-351.
Ramesh, B., Mohan, K., and Cao, L. 2012. "Ambidexterity in Agile Distributed Development: An Empirical Investigation," *Information Systems Research* (23:2), pp. 323-339.
Robey, D., Smith, L.A., and Vijayasarathy, L.R. 1993. "Perceptions of Conflict and Success in Information Systems Development Projects," *Journal of Management Information Systems* (10:1), pp. 123-140.
Sarker, S., Munson, C.L., Sarker, S., and Chakraborty, S. 2009. "Assessing the Relative Contribution of the Facets of Agility to Distributed Systems Development Success: An Analytic Hierarchy Process Approach," *European Journal of Information Systems* (18:4), pp. 285-299.
Sarker, S., and Sahay, S. 2003. "Understanding Virtual Team Development: An Interpretive Study," *Journal of the association for information systems* (4:1), p. 1.
Sarker, S., and Sahay, S. 2004. "Implications of Space and Time for Distributed Work: An Interpretive Study of Us–Norwegian Systems Development Teams," *European Journal of Information Systems* (13:1), pp. 3-20.
Sawyer, S., Guinan, P.J., and Cooprider, J. 2010. "Social Interactions of Information Systems Development Teams: A Performance Perspective," *Information Systems Journal* (20:1), pp. 81-107.
Standish Group. 2015. "Chaos Summary 2015." Retrieved 22nd November 2017, from http://www.standishgroup.com
Strauss, A., and Corbin, J. 1990. *Basics of Qualitative Research*. Newbury Park, CA: Sage.
Van den Bossche, P., Gijselaers, W., Segers, M., Woltjer, G., and Kirschner, P. 2011. "Team Learning: Building Shared Mental Models," *Instructional Science* (39:3), pp. 283-301.
Van Knippenberg, D., and Schippers, M.C. 2007. "Work Group Diversity," *Annual Review of Psychology* (58), pp. 515-541.
Van Maanen, J. 1988. *Tales of the Field: On Writing Ethnography*. University of Chicago Press.
Venkatesh, V., and Windeler, J.B. 2012. "Hype or Help? A Longitudinal Field Study of Virtual World Use for Team Collaboration," *Journal of the Association for Information Systems* (13:10), p. 735.
Wakefield, R.L., Leidner, D.E., and Garrison, G. 2008. "Research Note—a Model of Conflict, Leadership, and Performance in Virtual Teams," *Information systems research* (19:4), pp. 434-455.
Windeler, J.B., Maruping, L.M., Robert, L.P., and Riemenschneider, C.K. 2015. "E-Profiles, Conflict, and Shared Understanding in Distributed Teams," *Journal of the Association for Information Systems* (16:7), p. 608.
Yang, X., Tong, Y., and Teo, H.H. 2015. "Fostering Fast-Response Spontaneous Virtual Team: Effects of Member Skill Awareness and Shared Governance on Team Cohesion and Outcomes," *Journal of the Association for Information Systems* (16:11), p. 919.