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Social Complexity and Team Cohesion in Multiparty Information Systems Development Projects

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Social Complexity and Team Cohesion in Multiparty Information Systems Development Projects

Despite the proliferation of Critical Success Factors (CSFs) for Information Systems Development (ISD), the rate of ISD project failure continues to remain exorbitantly high. In particular, social complexity is increasingly seen as an innate feature of multiparty ISD projects which make them less amenable to being 'tamed'. However, an understanding of the intricacies of social complexity and how it impacts team cohesion in multiparty projects remains nascent. In this paper we offer findings from the case study of a funded academia-industry collaboration to investigate the elusive phenomenon of social complexity. A theoretical framework is developed to reveal the factors which contribute to social complexity and its impact on team cohesion in multiparty ISD projects. The findings derived from the application of this lens reveal the numerous challenges to team cohesion that arose from the interplay between macro and micro-level factors. Theoretical and practical implications from the paper are also outlined.

Keywords: ISD; social complexity; industry-academia collaboration; cohesion.

Introduction

Modern organisations are under increased pressure to conduct Information System Development (ISD) projects that confront disruptive social and technological change. However, managing ISD projects in disruptive environments is far from a routine or simple task. For instance, despite the proliferation of Critical Success Factors (CSFs) for ISD project management, ISD project failure rates have remained high over the last three decades (Standish Group, 2015). In particular, social complexity has been identified as an innate feature of ISD which makes projects less amenable to being 'tamed', or represented by well-defined CSFs of project management (Doherty, Ashurst, & Peppard, 2012). For instance, ISD projects are often shaped by entrenched differences between individuals and groups who seek to inscribe their unique interests and meanings into an IT object (Azad & Faraj, 2011).

This is especially true of multiparty projects involving individuals from different disciplinary and organisational backgrounds (Levina, 2005; McCarthy, O'Raghallaigh, Fitzgerald, & Adam, 2018); for instance, in the health information systems domain, the vested interests of clinicians (i.e. consultants and nurses) can often be very different to those of technologists (i.e. developers and analysts), and vice versa. Emerging social complexity can in turn lead to a situation where the perspectives and interpretations of team members become more and more fragmented (Boughzala, De Vreede, & Limayem, 2012; Yang, Tong, & Teo, 2015). While divergent thinking is important for innovation,

team cohesion still remains crucial to ISD team performance as it enables the coordination of team resources towards the achievement of defined goals (McAvoy & Butler, 2009). Team cohesion refers to team members' ability to generate a shared understanding of and shared commitment to ISD processes and outcomes (Boughzala et al., 2012; Yang et al., 2015). In particular, team cohesion is important in non-tame settings to ensure that collaboration is not impeded by deep-rooted tensions between pluralistic value systems.

Yet despite the significant attention directed towards the CSFs of ISD project management (Doherty et al., 2012), an understanding of the interplay of social factors that shape team cohesion in multiparty ISD projects remains nascent. In particular, this gap in literature suggests the need to direct increased attention towards how the socio-political context shapes the conduct of ISD (c.f. Azad & Faraj, 2011). Our research objective aims to address this gap by contributing theoretical and empirical insights into the hidden features of social complexity which impact team cohesion in multiparty ISD projects. In particular, we seek to investigate the following research questions: (i) *What factors contribute to the emergence of social complexity in multiparty ISD projects?* And (ii) *How does the emergence of social complexity impact team cohesion?*

In order to address these research questions, we present empirical findings from the in-depth case study of a multiparty ISD project which involved partners from academia and industry. The main contribution of this paper is a novel theoretical framework that helped reveal inherent social complexity in the case. Based on the findings, we suggest the need for researchers and practitioners to rethink how they approach multiparty ISD projects by directing increased attention towards the social factors which impact team cohesion. This requires the veneer of traditional CSFs to be complemented with an understanding of the variegated social factors which shape the actions of individuals and groups in practice, as well as the cohesive or fragmented nature of their interpretations.

The remainder of the paper is structured as follows: Section 2 provides a literature review while Section 3 outlines the theoretical development of the paper. Section 4 describes the research design and Section 5 offers a discussion of case study findings. Section 6 then brings the paper to a close with a conclusion.

Literature Review

Extant literature has described ISD as an inherently political process, one that is shaped by complex social interactions between individuals (Avgerou & McGrath, 2007; Hekkala & Urquhart, 2013; Sawyer, Guinan, & Cooprider, 2010). In particular, social complexity can emerge during the conduct of ISD due to underlying tensions between the diverse positions, goals, interests, and values of individuals and groups (Lim, Sia, & Yeow, 2011; Sawyer et al., 2010). For instance, depending on the inherent social factors at play, the interests and goals of one individual can be very different to those of other individuals within the group setting (Avgerou & McGrath, 2007). This is especially true of multiparty ISD collaborations that involve individuals from different disciplinary and organisational backgrounds i.e. as in academia-industry collaborations (Levina, 2005). Therefore,

multiple value systems could co-exist within a distributed group, which in turn shapes decision making processes (McCarthy et al., 2018).

The emergence of 'subgroups' within a larger ISD project team can further lead to social complexity due to perceived differences in positions, interests, and values (Aggarwal, 2014). Subgroups can be defined as a "subset of members of a work team, which is characterized by a unique interdependence that distinguishes the subset from other members of the team" (Pflügler, Wiesche, & Krcmar, 2018, p. 5484). In particular, subgroups can emerge due to hypothetical 'faultlines' within an ISD team, such as differences in organisational affiliation and disciplinary background (Carton & Cummings, 2012). Faultlines can in turn lead to a situation where individuals from the same subgroup create tight bonds, and engage less frequently with those considered outsiders to the subgroup (Aggarwal, 2014). A typical faultline in academic-industry collaborations would be the delineation between 'researchers' and 'practitioners'.

ISD therefore represents a socio-political process in which individuals and groups seek to inscribe their diverse interests and meanings into a proposed technology artefact (Azad & Faraj, 2011; Hekkala & Urquhart, 2013). This view challenges prior assumptions that individuals are wholly objective and rational when making decisions in ISD projects. While an ISD project may be viewed as routine based on mechanistic CSFs (e.g. structured project planning, ongoing stakeholder engagement, and senior management sponsorship), these CSFs often ignore the social complexities inherent in the actual conduct of ISD. Consequently, an awareness of the hidden features of social complexity is essential to mitigate conflict between individuals and groups and build more effective collaborations (Hekkala & Urquhart, 2013). Empirical studies of social complexity must aim to uncover these hidden features within a dynamic socio-political context, one characterised by entrenched differences between pluralistic value systems.

In light of these challenges, team cohesion becomes crucial to the performance of ISD project teams, enabling them to work together in the development of a technology object. Team cohesion refers to team members' ability to generate a shared understanding of and shared commitment to ISD (Boughzala et al., 2012; Yang et al., 2015). Team cohesion requires team members to bridge differences in interpretations around an object of understanding (i.e. IT artefact) and build consensus through ongoing collaboration (Bittner & Leimeister, 2014; Conklin, 2005). However, generating cohesion can be a difficult task, particularly in the context of multiparty collaborations. For instance, the knowledge of different communities of practice is typically invested, situated, and tacit, which can make knowledge sharing problematic.

The concept of fragmentation offers a synonym for the challenges associated with low levels of team cohesion where the interpretations of individuals are more dispersed than unified (Conklin, 2005; Lim et al., 2011). For instance, fragmentation can arise where individuals hold dispersed meanings and perspectives around an IT artefact and seek to pursue competing interests and goals during the conduct of ISD practice (Azad & Faraj, 2011). Extant literature suggests that fragmentation can only be resolved through 'constructive conflict' where individuals agree to enter into a dialogical process that

clarifies and resolves differences in interpretations (Bittner & Leimeister, 2014).

Theoretical Development

This section outlines a theoretical framework previously presented in McCarthy, O'Raghallaigh, Fitzgerald, and Adam (2017) and McCarthy et al. (2018), which aims to assist in describing and explaining the sociotechnical interactions between individuals and groups. The unit of analysis is the field of practice, and an embedded unit of analysis focuses on the actions of team members and technological objects in the field (c.f. Bourdieu, 1977). Our theoretical development takes the form of a framework which is grounded in existing literature, including the seminal works of Parsons (1951) and Bourdieu (1977). Sociomateriality is further adopted as a sensitising device for empirical research (c.f. O'Raghallaigh, McCarthy, & Adam, 2017).

Drawing on the works of Parsons (1951), we outline three macro-level factors which shape the actions of individuals: *Structure*, *Identity*, and *Culture*. *Structure* deals with the different positions, roles, and rules which shape how team members take action to pursue goals across situations. *Identity* meanwhile deals with the different interests of team members which motivate their engagement in situations and courses of action. *Culture* refers to the different shared meanings that are internalised by team members overtime. The first part of our framework provides contextual insights into Structure, Identity, and Culture, and can suggestively be used to understand how these macro-level factors shape an individual's course of action across social spaces such as within a subgroup of the project team, the wider project team, and a team member's organisation.

We then draw on the works of Bourdieu (1977) to outline the micro-level factors which further shape the actions of individuals: *Goals*, *Approaches*, and *Means*. *Goals* deals with the intended course of action which will be pursued by individuals in the field of practice, which in turn influences decision-making in the field. *Approaches* refers to the 'modus operandi' of how individuals achieve goals which is guided by the tacit knowledge acquired through their accumulated experience in practice. *Means* refers to economic, social, cultural, and symbolic forms of capital which are utilised by individuals in practice. The second part of our framework provides practice-level insights into Goals, Approaches, Means, and can suggestively be used to understand how these micro-level factors shape an individual's course of action.

Following the works of Latour (2007, pg. 170), we assert that there is a continuous interplay between the macro-level (i.e. context) and micro-level (i.e. interactions):

> "Interactions do not really exist because they have to be 'put into' a context, nor that context never really exists because it is always 'instantiated' through individual practice… it might be possible to profit from this endless alternation between polar opposites to learn something about the real topography of the social."

Consequently, Table 1 looks at how the interplay between macro and micro-level constructs impacts team cohesion in ISD projects.

Practice	Structure	Identity	Culture
Goals	Examines how the interplay of structure (e.g. team hierarchies) and goals (e.g. IT artefact dev.) impacts cohesion between subgroup members.	Examines how the interplay of identity (e.g. interests) and goals (e.g. IT artefact dev.) impacts cohesion between subgroup members.	Examines how the interplay of culture (e.g. assumptions) and goals (e.g. IT artefact dev.) impacts cohesion between subgroup members.
Approaches	Examines how the interplay of structure (e.g. team hierarchies) and approaches (e.g. style of project management) impacts cohesion between subgroup members.	Examines how the interplay of identity (e.g. interests) and approaches (e.g. style of project management) impacts cohesion between subgroup members.	Examines how the interplay of culture (e.g. assumptions) and approaches (e.g. style of project management) impacts cohesion between subgroup members.
Means	Examines how the interplay of structure (e.g. team hierarchies) and means (e.g. team capabilities) impacts cohesion between subgroup members.	Examines how the interplay of identity (e.g. interests) and means (e.g. team capabilities) impacts cohesion between subgroup members.	Examines how the interplay of culture (e.g. assumptions) and means (e.g. team capabilities) impacts cohesion between subgroup members.

Table 1. Team Cohesion and the Interplay between Macro and Micro-Level Factors.

Research Design

An in-depth case study approach was chosen to study the information-rich case of a multiparty ISD project called "Athena". The project was a collaborative effort between an insurance company and an IS research centre. The Athena project was funded by 65% cash contribution from the national funding body, and 20% cash and 15% Benefit-In-Kind (BIK) contribution from the insurance company. The project's task, as defined by the remit of the funding scheme, was for the partners to develop "mutually beneficial" outcomes which could later be licenced and exploited. For instance, the proposal listed outcomes such as the development of IT solutions for remotely delivering technology-enabled insurance based services to a foreign market, and the dissemination of research findings in leading academic journals and conferences.

The project team consisted of: an actuary, innovation lead, and project manager in the insurance company, as well as a Principal Investigator (PI), co-PI, User Experience (UX) developer, and three analysts in the IS research centre. Two subgroups were seen to emerge based on the data gathered: the 'industry subgroup' consisting of the actuary, innovation lead, and project manager, and an 'IS researchers' consisting of the UX developer, analysts, PI, and co-PI. This case study provided a useful context for investigating the defined research question given the inherent uncertainty and novelty in the relationship between the two subgroups.

Data from the case study was triangulated from five different sources to increase the robustness of findings: Participant observations were gathered (1) during team meetings across the 15-month longitudinal timeframe, (2) informal conversations between project team members, and (3) ongoing day-to-day team interactions. (4) This data was complemented by five semi-structured interviews with members of the multi-disciplinary team between August 2017 and October 2017: The PI, co-PI, analyst, innovation lead, and project manager, with each interview lasting between 45 and 60 minutes. (5) Project documents, including team emails, were also used to derive further insights.

The lead author analysed case study data using two primary techniques: coding and vignettes. Open, axial, and selective coding, as per Strauss and Corbin (1990), were used to analyse the transcribed interviews. Open coding allowed the lead author to identify concepts related to social complexity and their associated properties and dimensions. Axial coding was then used to form relationships between codes through inductive and deductive reasoning. Finally, selective coding involved the adoption of a core category around the research. Vignettes were also used to produce, reflect on, and learn from participant observation data (c.f. Miles & Huberman, 1994).

Discussion of Findings

This section adopts the theoretical framework outlined in Section 3 to discuss how the emergence of social complexity impacted team cohesion. Due to page count restrictions, we chose to focus on four key cells of Table 2.

Practice	Structure	Identity	Culture
Goals	1) Emerging Hierarchies in the Project Team		4) Clashing Assumptions around Project Goals
Approaches		3) Differing Interests in Project Management	
Means	2) Structural Changes to Expand Team Capabilities		

Table 2. Cohesion and the Interplay between Macro and Micro-Level Factors.

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

This subsection looks at how social complexity arose from the interplay between structure and goals, and in turn impacted team cohesion. The following paragraphs highlight how the team hierarchy changed overtime as the industry subgroup began to position themselves over other team members and increasingly prioritised the goals of the insurance company during meetings. A side effect of this development was that the goals of the IS researchers received less attention. The funding body had asserted that funded projects should aim to develop "mutually beneficial" outcomes for both partners through ongoing co-operation and interaction. However, in practice, the insurance company's commercially-oriented goals (i.e. the pursuit of opportunities in the foreign market) received more focused attention from the project team than the academic goals (i.e. the publication of academic research) of team members in the IS research centre.

Initially the PI and innovation lead were at the apex of the project team hierarchy. Firstly, the PI assumed responsibility for managing the research methodology and the pursuit of academic endeavours in the project. Meanwhile, the CEO and executive director of the insurance company assigned the innovation lead as business owner of the Athena project which conferred her with the role of overseeing the project scope. A few weeks after the project's commencement, the executive director also assigned the actuary as 'project customer' to provide input around the insurance company's commercial goals. Following his assignment to the project team, the actuary increasingly began to override decisions by other team members, and defy the hierarchy outlined at the start of the Athena project. For example, while the innovation lead and PI had initially told the analysts to investigate novel technologies for offshore claims administration, the actuary was less convinced of these opportunities and instructed the IS researchers to direct increased attention towards new territories. As a result, the actuary eventually superseded the innovation lead and PI as primary decision maker, a de-facto role within the subgroup which had not been assigned at the outset of the project.

Team cohesion initially suffered as the IS researchers were uncertain which team member should have the final say on the project scope. However, within three months, the project team increasingly began to recognise the actuary as the primary decision maker during team meetings, and the new informal hierarchy began to overthrow the formal hierarchy that had been defined at the start of the project. While the innovation lead continued to provide feedback on the IS researchers' findings, her engagement focused more on project management related goals around resource allocations, and less on issues related to the project scope. This did not seem to create difficulties in the relationship between members of the industry subgroup as the innovation lead seemed content to confer the actuary with the de-facto responsibility for directing the project scope as she valued his input around the insurance company's commercial-oriented goals.

The actuary seemed to consider it necessary to adopt this de-facto role due to the lack of cohesive decisions on the insurance company's goals. For example, following his assignment to the Athena project, the actuary changed the scope considerably to include a number of new territories which he felt aligned better with the insurance company's goals. The actuary also overrode previous decisions by the project team around the prioritisation of market territories, and increasingly placed more importance on investigating opportunities which he felt would deliver the most value. The actuary was also eager to conclude each conversation by making a final decision on how the project team should proceed, and whenever conversations during team meetings dragged on without a call being made, the actuary would show some frustration by interjecting to assert what tasks needed to be completed by the IS researchers going forward.

While this structure proved constructive for cohesion around the insurance company's goals, there were also negative consequences. For instance, the actuary often made decisions without having considered the entire scope of work that had been produced by IS researchers, and instead made decisions based on 'gut instinct' and anecdotal findings from unknown sources. An analyst alluded to this when discussing the actuary's influence over the project scope: "*he would have cleared stuff off the board as a non-runner pretty quickly without even having a detailed look at the topic… (and) say that 'yes that's a potential runner', or 'no that's way beyond what we can do"*. This constrained team

cohesion as some IS researchers felt that these areas of research were ruled out of scope too early, despite their potential to deliver high levels of value. Indeed, a sign that these areas might have ruled out of scope too quickly was seen later when the industry subgroup indicated that they were becoming less convinced of the targeted opportunities.

Another limitation of this this structure was that it also constrained the IS researchers' ability to explore alternative goals. For instance, the publication of findings had been listed as a key goal for the IS researchers in the project proposal, and the IS Research Centre requested full "publishing rights following a reasonable and defined review process by the (Insurance Company's) top management". In spite of this, the IS researchers found it difficult to discern potential academic contributions at the end of the project, and they were constrained in their ability to create a formal programme for research. The industry subgroup had sought to ensure that the project was primarily problem-driven based on the commercial goals of the insurance company, and as a result the co-PI noted that the IS researchers had limited scope to focus on academic research and theoretical development: "*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… making sure that there is a meaningful outcome. And that may not necessarily be an academic output"*.

2) Structural Changes to Expand Team Capabilities (Structure – Means)

This subsection looks at how the interplay between structure and means also created social complexity that impacted team cohesion. The following paragraphs highlight how structural changes were increasingly made to the means of the project, with new actors brought in to expand the capabilities available within the Athena project. These structural changes were primarily driven by the industry subgroup who sought to fill perceived skill set gaps through the assignment of additional internal and external resources to the project team. This subsection also highlights how structural changes to the team pointed towards growing issues of trust between the industry subgroup and IS researchers, in particular with regards to the IS researchers' capabilities to deliver on the proposed project scope.

The project manager was recruited a few months into the project to work full-time on the Athena project and closely monitor the work of the IS researchers. This decision was taken despite the PI already having recruited the co-PI as a project manager in the IS research centre. 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. But mainly (my role) was related to the day to day delivery of the project*". The decision was surprising as the co-PI seemed better suited to assume the responsibility of monitoring the work of the IS researchers, given that the other project manager had limited prior experience of managing either ISD projects or research teams. Nevertheless, the industry subgroup felt the project manager's skills in project management could help ensure that the IS researchers' capabilities would be better employed for the duration of the project.

The assignment of two project managers initially constrained team cohesion as reporting relationships had not been formally defined. The project manager had hoped that the IS researchers would report directly to her and the co-PI on all project matters as a first port

of call; however, in practice the UX developer and analysts felt less of an obligation to communicate with the project manager once the co-PI's clearance had been given. At certain times the relationship between the co-PI and project manager was strained as the co-PI became frustrated by the project manager's demands for structured feedback and reporting. As stated by the co-PI: "*the project management relationship was difficult at times... certainly from my perspective as the IS research centre's project manager and from the team's perspective, that did change the dynamic and actually the nature of some of the deliverables*".

In addition, towards the end of the project, the industry subgroup contracted a market consultant with 11-years' experience in the foreign market to validate the work completed by the IS researchers. The market consultant was primarily recruited to help address the IS researchers' lack of commercial experience in the foreign market and ensure that the industry subgroup would have a more complete picture of how the market operated in order to assess the needs of potential customers for the proposed IT solutions. As stated by one analyst, the involvement of a market consultant was seen as an essential step by the industry subgroup: "*they felt that there was a piece of reassurance from having this person on board because they were on the ground and their level of knowledge… would have been at a step that none of us had*".

The industry subgroup hoped that the market consultant's input would help improve cohesion by addressing uncertainties around the technical and commercial viability of the developed IT solutions, something which the IS researchers had found difficult to validate by assimilating niche pieces of information on the foreign market. For instance, the IS researchers had little to no oversight of the common terms and conditions outlined in service level agreements between customers and their outsourcing provider in the foreign market, which made the industry subgroup question some of the findings put forward by the analysts and doubt the viability of the IT solutions being investigated.

This restructuring of the team may point towards the industry subgroup's lack of trust in the IS researchers' capabilities to deliver on the proposal unaided. Issues of trust in the team's capabilities seemed to develop from the perception that the IS researchers, while highly competent in assimilating data from field research and developing prototype IT artefacts, lacked the commercial knowledge to deliver real organisational change and strategic value. Based on her experiences in the Athena project, 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)*".

In addition, there was a considerable level of senior management oversight in Athena, with both the executive director and CEO monitoring the project internally within the insurance company. The actuary, as a member of senior management, was also directly assigned as a member of the project team to ensure that the work undertaken by the IS researchers aligned with the company's strategic programme. In the end, the insurance company's high level of involvement in the Athena project likely resulted in their proposed 15% BIK contribution being surpassed; however, it was seen as a necessary

precaution to ensure that the team would deliver the proposed outcomes. This may also point towards issues of cohesion and trust in the team's overall capabilities.

3) Differing Interests in Project Management (Identity – Approaches)

This section looks at how the interplay between identity and approaches led to social complexity which in turn impacted team cohesion. In particular, social complexity arose as the subgroups had very different collective identity-related interests around the approach to ISD and the level of uncertainty that would be tolerated. The following paragraphs describe how the industry subgroup assumed control of the project management approach based on their collective interest in minimising perceived uncertainties associated with the scope. The impact on cohesion is also discussed.

The innovation lead was interested in tightly control all work tasks undertaken by the IS researchers as she would be held accountable in the insurance company for the final project outcome. This professional interest was evident in the careful attention she directed towards reviewing the IS researchers' work, particularly before they were due to present in front of senior management. As stated by the co-PI: "*the (industry subgroup) had reputational investment in the project as well so I think it was very important to them that the outcome looked right*". Based on this identity-based interest, the innovation lead also closely supervised the project manager's approach to monitoring the work of the IS researchers and oversaw the creation of a project plan. The project manager pointed towards the importance of project management as a safeguard to integrate the team's diverse backgrounds: "*if you're having a lot of mismatches that kind of complicates things a little bit... you just have to go the extra mile in terms of project management*".

Following the recruitment of the project manager, the industry subgroup increasingly sought to micro-manage the IS researchers' work using a protocol of detailed descriptions of work with hard deadlines for completion. For instance, the innovation lead and project manager sought to ring-fence the work that would be carried out by the IS researchers through the creation of a detailed project plan and Gantt chart. This approach was seen as an essential to build cohesion and ensure that the insurance company would minimise risks associated with their cash and BIK 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*".

However, issues of cohesion began to emerge overtime due to differences between the interests of the subgroups. For instance, unlike the industry subgroup, the IS researchers did not seem overly concerned by perceived uncertainties around the project scope and timeline. The IS researchers were more interested in adopting a laissez-faire approach to project management early on, which provided increased flexibility through short-term planning and ad hoc decision making. In particular, this approach was more compatible with the IS researchers' collective interests in investigating leading edge technologies as it allowed them more autonomy to explore different areas of research and change course whenever new findings came to light. 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?'".

Issues to cohesion emerged as the IS researchers felt the industry subgroup's intolerance for uncertainty conflicted with their collective identity-related interest to engage in 'blue sky thinking'. One analyst remarked that the industry subgroup's drive to continuously refine the scope created tensions between the subgroups as there was little opportunity for the IS researchers to explore more disruptive technologies and methods that might deliver increased benefits. Instead the industry subgroup's approach often required the IS researchers to complete routine tasks that did not fully exploit their expertise, such as online desk research. In contrast, the analyst felt their skills could have been better employed by investigating leading edge technologies rather than established service delivery mechanisms which the industry subgroup perceived to be less risky.

The innovation lead recognised that the IS researchers viewed the industry subgroup's micro-management of the project approach as constraining compared to their preferred approach of uncovering opportunities through blue-sky thinking. However, the innovation lead was adamant that such an approach would not be appropriate in the context of the Athena project given the commercial demands faced by the insurance company: "*I did think alright that from the project management perspective, that mightn't have been something that (the IS researchers) were as familiar with… I suppose it's the nature of research, you don't want to be confined. You want blue sky thinking to certain extents. But we scope out everything we have to do in terms of high level timelines and costs and benefits"*. In particular, the innovation lead was concerned that the project would run over budget and fail to deliver benefits to the insurance company had the IS researchers been allowed to engage in blue-sky thinking.

4) Inconsistent Assumptions around Project Goals (Culture – Goals)

This section looks at how social complexity emerged from the interplay between culture and goals and impacted team cohesion. In particular, the two subgroups harboured conflicting assumptions around the project which at times made it difficult for the project team to reach cohesion around the overall goals of the Athena project. For instance, the two subgroup each had different assumptions around what a project such as Athena typically entailed, including the primary objectives and the boundaries of what were achievable. The following paragraphs discuss how these conflicting assumptions impacted team cohesion around the project goals.

The PI noted that the industry subgroup often came with cultural assumptions around projects which did not always reflect the IS researchers' view. For instance, at the start of the project, the PI noted that the industry subgroup had expected the IS researchers to conduct work more akin to management consultancy or market research, rather than research and development. As a result, the PI felt he had to continually reiterate the IS researchers' objective, 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*". The project manager also noted the difficulties faced

in reaching cohesion around the project's goals: "*there would have been moments perhaps when you were talking about… research specifics and I would be thinking 'what does that entail?'… maybe having that background (in research) would help*".

However, despite the PI's efforts, the level of team cohesion was constrained as the industry subgroups assumptions around the project goals still remained. For instance, the industry subgroup often requested 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. Additionally, at the end of the project, the industry subgroup expected the IS researchers to provide a set of focused recommendations on how they should proceed, somewhat similar to the services that a management consultancy firm would provide. While the PI and co-PI conceded to survey a sample of customers to better inform the artefact design, they refused to provide recommendations and instead put forward a set of options.

Furthermore, issues of cohesion emerged around each partner's level of involvement in achieving project goals. While the funding scheme had envisioned that both partners would both contribute "significant input… in designing and undertaking the project", in practice, the relationship between the partners in the Athena project resembled that of a client-provider relationship, in which the goals of the project team were exclusively formulated by the industry subgroup, while the IS researchers were delegated to undertake the majority of project work alone. Members of the industry subgroup were available to provide feedback to the IS researchers as requested however, unlike the IS researchers, they did not deliver tangible outcomes unless they were of direct benefit to the insurance company. Instead, the industry subgroup's involvement in the project was limited to managing the scope which they controlled. The industry subgroup also insisted that decision-making within the team should always prioritise commercial criteria, and therefore academic pursuits received little to no attention.

The industry subgroup also seemed to assume a sense of ownership over the IS researchers' time and felt entitled to request the completion of any task that they deemed necessary. This assumption may have been shaped by the PI's discussions with the CEO and executive director prior to the project, and the attention given to the insurance company's goals in the project proposal. However, a consequence of this assumption was that cohesion was impeded, and the PI and co-PI often had to manage the industry partner's expectations around what the UX developer and analysts could realistically achieve given the finite resources that were available. These demands eventually expanded beyond the scope of work described in the project proposal, such as when the industry subgroup requested the analysts to produce a report on an existing competitor within the domestic market. Nevertheless, as stated by one analyst, while at times it proved difficult for the IS researchers to achieve these goals, it did help generate cohesion around the industry subgroup 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*".

Having said that, the level of cohesion around mutually beneficial goal was still limited. Differences in cultural assumptions remained for the duration of the Athena project and continued to shape how the insurance company would perceive the goals of future

collaborations with the IS research centre. For instance, during a subsequent collaboration between the two partners in the connected health domain, the innovation lead and project manager in the insurance company were surprised when the IS research centre's project manager asked them to commit to a project plan he had developed and engage proactively in the completion of project work. Instead the innovation lead asserted that their involvement would be limited. However, as a result, the insurance company later found it difficult to ascertain the benefits that could be derived from the project.

Conclusion

In this paper, we presented findings from a 15-month multiparty ISD project involving an insurance company and IS research centre. Based on the application of our theoretical framework, the findings reveal how the emergence of social complexity impacted team cohesion in unexpected and variegated ways. In particular, the framework elucidated how the interplay of macro and micro-level social factors impacted cohesion. These factors go beyond mechanistic CSFs of project management, and suggest that cohesion is a dynamic and multifaceted concept. We therefore assert the need for researchers and practitioners to look at ISD projects in a new way in order to reveal the hidden features of social complexity which impact cohesion within dynamic socio-political contexts.

The theoretical implications of this paper centre around the framework developed by the authors. Drawing on the insights of Parsons and Bourdieu which we see as complementary, our theoretical framework points towards how the dynamic interplay between macro-level factors and micro-level factors impact team cohesion within a multiparty ISD project team. In particular, the lens focuses on the continuous interplay between the concepts of *structure*, *identity*, *culture* (i.e. macro-level) and *goals*, *approaches*, *means* (i.e. micro-level). While extant literature has previously studied these concepts as distinct phenomenon, the lens presented in this paper illuminates the dynamic relationship between each, where boundaries between the macro-level and micro-level concepts are fluid rather than constant. This novel contribution in turn uncovers hidden intricacies of social complexity within the context of multiparty ISD projects.

As for the practical implications of this paper, we argue that the traditional way of viewing ISD projects can often overlook inherent social complexities in the everyday life of an ISD project. While CSFs of project management are useful tools for guiding the early stage planning of an ISD project, they are unlikely to elucidate the dynamic interplay between structures, identities, and cultures both internal and external to the project team. Therefore, we suggest the need for new complementary perspectives that reveal the variegated social factors which shape ISD practice. Future research efforts should also aim to add insights into cohesion across different social spaces such as within a subgroup, the wider project team, or an individual's affiliated organisation.

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