Making IT Happen: The Pivotal Role of Knowledge Sharing for Information Technology Deployment Success during Joint Venture Change [1]

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Main Message

Tacit and explicit knowledge sharing must be continually cultivated to enable information technology implementation success.

Key Points

- Effective information technology deployment necessitates a holistic focus beyond technical and legacy factors to include social, organisational, political and interpersonal dimensions.
- Attention to cultural integration is a critical component of managing joint venture change and building employee engagement, perception of legitimacy and knowledge sharing norms.
- Individual employees occupy a key role in determining intended strategic impacts by committing to and enacting change efforts, particularly though making discretionary decisions to share their knowledge or alternatively to hoard, hide or disengage from sharing; an outcome which may be influenced by perceptions on knowledge ownership and value.

1. Introduction

In an environment of accelerating complexity (Hempel & Martinsons 2009), organisations are continually challenged by strategic renewal (Ben-Menahem et al. 2013) to ensure ongoing efficacy and business survival and moreover, to identify their next source of growth. Choices include growing organically, through merger and acquisition, or by the formation of alliances such as joint venture companies (Reinartz et al. 2011). Collaborative inter-corporate arrangements are increasingly popular with 44,000 transactions totaling more than 2.9 trillion GBP recorded in 2015 alone (Institute of Mergers, Acquisitions & Alliances 2016). Despite this popularity, such strategic moves do not come without risk and uncertainty. Many fail to actualise their potential (Ariño & de la Torre 1998) and lead to poor performance or even early termination (Cui & Kumar 2012) due to the inherent complexity that organisational integration involves (Beamish & Lupton 2009).

Of all types of strategic alliance, joint ventures are second only to merger in the level of integration required (Todeva & Knoke 2005). Motivation to partner can span organisational, economic, technological, strategic and political dimensions but the overarching intent of such a move is broadly to enable the parties concerned to share risk and create sustainable value (Doz, Yves & Hamel 1999) through the synergies that emerge when complementary capabilities are combined (Oxley & Sampson 2004). Inter-firm cooperative agreements also provide opportunities for new knowledge access, exchange and organisational learning (Khamseh & Jolly 2008). Within telecommunications, a technology based rationale is particularly strong, for example to run, enhance and share network infrastructure (KPMG 2009) but the complexity of integration required remains challenging (Åberg & Sias 2004), particularly in relation to legacy systems.

[1] J.E.L classification codes: D83, L10, L24, M15, O33.

The case study provides an example of a related joint venture that is typically orientated towards the sharing, optimisation and integration of extant resources to leverage economies of scope and scale, rather than aiming to learn vastly new capabilities or understand new markets (Cui & Kumar 2012). To deliver an integral organisation that can achieve its intended strategic impacts requires radical change (Gersick 1994) which is problematic to realise (Palmer & Dunsford 2002) and can result in high rates of failure (Oreg, Vakola & Armenakis 2011). Effective mechanisms to manage and combine shared resources and facilitate multi-level exchange (Kogut 1988; Inkpen 2000; Wei, Choy & Yew 2009) become ever critical, particularly the identification, transfer and internalisation of tacit, collective and embedded knowledge (Todeva & Knoke 2005).

Knowledge sharing is recognised as the pivotal stage in knowledge management (Jackson et al. 2006) and can be actualised across many channels, notably by means of articulation, stimulation by incentive or through enabling influences which can range from a supportive organisational culture (Bock et al. 2005), to dedicated tools such as knowledge management systems (Günsel 2015). Despite the benefits of IT-enabled learning (Kim & Lee 2006; Timonen & Ylitalo 2007) these mechanisms must be managed in a consistent and integrated way to enhance the quality of the overall knowledge management process (Jiménez-Castillo & Sánchez-Pérez 2013). Similarly, sharing behaviors can be impacted by a range of factors, particularly at the individual level (Ipe 2003) which require continual cultivation to scaffold employee participation. Effective knowledge sharing is therefore a primary rationale for joint venture formation *and* a core determinant of its evolution and ultimate success (Ariño & de la Torre 1998).

This empirical mixed methods paper examines, over a two year period, the formation of a joint venture between two organisations in the UK mobile telecommunications sector. It inductively combines longitudinal focus group and interview data, fully integrated with primary and secondary quantitative sources.

The core aims of the paper are to:

1) - characterise how the nature of IT change evolves over time during joint venture formation

2) - determine how knowledge sharing influences, and is influenced by, changes to IT over time

3) - examine the implications of knowledge sharing patterns on the strategic impact of a joint venture

4) - contribute to the call for greater methodological diversity, in particular for additional mixed methods and longitudinal research designs (Wang & Noe 2010; Pettigrew 1985)

5) – advance the future research agenda and offer practitioners enhanced understanding of how IT deployments can be effectively managed during joint venture change

The paper is structured into five further parts as follows: in the first, the literature review positions the development and call for this research. In the second, a contextual background for the case study organisation is provided. In part three, focus moves to the research methodology and details the specific design employed and its rationale. In part four, integrated core findings and discussion are presented, as recommended for mixed methods approaches (Heyvaert et al. 2013) alongside potential study limitations and developments. Part five offers conclusions and implications to benefit the future research agenda and application for practitioners. This aims to guide positive organisational change (Tkaczyk 2015) and successful IT deployments, moving away from potential causes of failure.

2. The Complexity of Transformational Change

In contrast to more developmental, transitional or convergent forms, it is argued that large-scale, deep structure, transformational change is problematic to manage due to the intangibles involved in achieving the organisational shift intended (Anderson & Anderson 2001; Palmer & Dunsford 2002) and its reliance on individuals to commit to and enact change efforts (George & Jones 2001). This is salient to the challenges of joint venture integration (Beamish & Lupton 2009) which are influenced by a variety of contingent factors such as environmental uncertainty, alongside specific characteristics of alliances, for example emotional impact on employees (Kiefer 2002) and IT resource complexity (Cui & Kumar 2012).

Indeed, many joint ventures including the case in scope, assert a strong access to technology or technological convergence rationale (Todeva & Knoke 2005; Davis 2012) yet actualisation is frequently difficult with high rates of specific IT deployment (Feld & Stoddard 2004), and overarching alliance (Harrigan 1988) failures. Adopting a resource and knowledge-based perspective, the pivotal role of knowledge sharing during transformational joint venture change is now discussed, with a focus on benefiting the cycle of IT integration (Carlile & Rebentisch 2003) and its strategic impact.

2.1 The Pivotal Role of Knowledge Sharing

The sharing of knowledge is established as a leading competitive asset (Kearns & Lederer 2003; Khamseh & Jolly 2008) and the key determining stage in knowledge management to create a context for change success (Argote, McEvily & Reagans 2003; Jackson et al. 2006). It can offer collaborative benefits across individual, team and organisational levels (Davenport & Prusak 1998) by exploiting and capitalising on knowledge-based resources. Alternate but not interchangeable terms include knowledge distribution and diffusion which stress fluidity; knowledge transaction or exchange which emphasise interchange, reciprocity and seeking; and knowledge transfer which focusses on its movement to different units, divisions or organisations (Szulanski, Cappetta & Jensen 2004; Cabrera, Collins and Salgado 2006). However, knowledge sharing is neither automatic, nor should it be taken for granted; requiring continual investment in effort and time (Reagans & McEvily 2003; Bradley & Seeman 2006).

Environmental turbulence, which may be a driver or an impact of joint venture formation, can influence knowledge effectiveness and/or relevance (Siggelkow & Rivkin 2005) and increases organisational dependence on effective knowledge sharing (Collins & Smith 2006). However, it may also reduce the quantity of knowledge shared (Ju et al. 2009) and by affecting norms and dynamics, can influence individual decisions to share (Leonardi & Treem 2012). Contextual compatibility, highly relevant to the relationship between joint venture parties, is also influential (Huang & Wang 2002) with employees' very openness to change impacted by the knowledge they have (Miller, Johnson & Grau 1994). Further, the type of knowledge being shared matters. High complexity can increase the fragmentation of knowledge among individuals (Simonin 1999) whilst more tacit forms have sticky, experiential, sense and intuition based properties (Polanyi 1966) that are difficult to exchange across borders (Sazali et al. 2010) yet afford the most potential to contribute towards sustainable competitive advantage (Helm 2010).

In a leading conceptual study, Ipe (2003) asserts that an individual's knowledge sharing behaviour is impacted by the interplay of four factors: motivation to share, the nature of knowledge, organisational culture and opportunity to share. Factors related to the individual sharer, for example personality traits; and more specifically the degree of idiocentrism or allocentrism, can also be influential (Matzler et al. 2008). Of the range of challenges in achieving optimal exchange identified, many are relationship based, notably related to variant perceptions of value (Sun & Scott 2005), trust (Kankanhalli, Tan & Wei 2005), management support (Cabrera et al. 2006), cultural differences, strategic misalignment and knowledge protection (Alexy, George & Salter 2013; Solli-Saether, Karlsen & van Oorschot 2015). Intention to share and actual sharing behaviour can also become disconnected (Kuo & Young 2008) as individuals do not always act consistently with the intentions they espouse.

The nature of knowledge itself resides on a continuum of tacit-explicit (von Krogh 2012), simple-complex and core-peripheral (Khamseh & Jolly 2008). It may be understood from an abstract, contextual, philosophical, faith-based, practical, metaphorical or feminist lens (Chisholm 1989), with the contextual and practical perspectives most salient to this research. Although knowledge exists across multiple levels; team and organisational level knowledge are primarily impacted by the extent and effectiveness of sharing practices undertaken between employees (Wang & Noe 2010). Knowledge is created, controlled and enabled at the level of the *individual* (Ipe 2003) alongside their social practices (von Krogh 2012). These are the very investors who engage in the discretionary behaviours to create, apply, transmit, store, share and acquire knowledge as aligned with their motivation, ability and opportunity to do so (Kelloway & Barling 2000). Knowledge sharing at an individual level of analysis therefore becomes the locus of this study, reflecting the importance of each employee in determining the intended strategic impacts of change by sharing what they know.

2.2 The Impact of Information Technology

Within the UK and European mobile telecommunications industry there has been an increasing trend towards operators forming joint ventures, particularly in relation to sharing network infrastructure in order to spread risk and financing costs; improving value for both parties (KPMG 2009). Moreover, effective application of information technology has the potential to influence a range of organisational strategic variables (Mahmood & Soon 1991), from enabling improvements in supply chain integration that benefit business performance (Xu, Huo & Sun 2014), to providing the IT infrastructure flexibility which can be a source of sustainable competitive advantage (Chung, Rainer & Lewis 2003). The advance of third platform technologies such as social media, mobility and big data, offers partners new conduits for smart, advanced and invisible analytics that can deliver actionable business insights, whilst dynamic cloud computing offers the capacity for increased agility (Kar 2014).

Legacy systems are pervasive in telecoms however, given the initial rapid growth of mobile operators and the plethora of new applications and services that resulted. This is not always a negative, with many legacy systems perceived by practitioners to be business critical, reliable and proven (Galinium & Shahbaz 2014; Khadka et al. 2014). Conversely, such systems are typically hard-coded with difficult to use interfaces that are designed for rigid functionality; making system integration or migration complex. This can risk creating or perpetuating knowledge silos in functional areas. Legacy systems are also often built on undocumented and embedded business rules, becoming arduous and expensive to maintain with time and unable to take full advantage of big data to support service personalisation (Paehr 2007; Henry 2013; Khadka et al. 2014). A specific challenge and opportunity of the case organisation is IT consolidation alongside building a new IT infrastructure to embrace the cloud.

Technology is also a significant enabler for knowledge management best practices (Alavi & Leidner 2001) providing both dissemination and sharing structures from integrated knowledge systems (KMS) with repositories and portals, to digital communication networks (Voelpel, Dous & Davenport 2005). This can enable knowledge exploration and/or exploitation processes to scaffold learning at individual, team and organisational levels (Gold, Malhotra & Segars 2001; Park et al. 2015). Specific affordances include enhanced speed of transferability (Tseng 2008), degree of visibility (Vaast & Walsham 2005) and capacities for integration (Heinz & Rice 2009). It can also aid collaborative problem solving, decision support and daily work performance (Zhen, Wang & Jian-Guo 2013).

However, IT deployments have historically proved problematic (Feld & Stoddard 2004), for example functionality needs being lost in translation across IT architects and business users (Figueiredo et al. 2014) and a lack of IT/Business alignment maturity, a particular issue in telecoms (Luftman 2011). Incidences of budget, time and scope creep in IT projects are also broadly recognised. In respect to KMS, these problems can result in a knowledge application gap, reducing practices of knowledge sharing and re-use (Alavi & Leidner 2001; Anantatmula & Kanungo 2010) that are critical, especially during change. This may be influenced by factors related to the system, the user, the organisational context and/or the knowledge itself (Loebbecke & Crowston 2012). IT implementation therefore moves beyond a one off focus on specific technical or practical issues and must encompass an iterative and integrative orientation on organisational, social, political and interpersonal dimensions (Swanson 1988).

3. A Joint Venture Telecoms Case Study

The context for this study is an equal equity national joint venture in the UK mobile telecommunications industry; newly formed at the start of the research in 2012. Both partners were established service providers, with one holding a more dominant position in terms of length of time in operation, domestic market share, distribution footprint and IT and network infrastructure. No form of strategic alliance had existed previously between the two parties who have been anonymised to preserve confidentiality. The joint venture agreement was locked into a minimum term of three years and forms an alliance across similar technologies with benefits of scope and scale, technological overlap and complementary expertise across video, broadband, mobile, B2B and B2C services. It aims to achieve cost leadership by generating significant efficiencies through Capex, cost and

revenue synergies. Two prominent examples are Opex savings in Network and IT to be gained by mobile site rationalisation and Capex savings sought via network integration and unification, alongside expanded shared network coverage.

The UK mobile telecommunications market has been one of the largest, most competitive and highly consolidated in Europe for several years, before a more recent move towards convergence (Carse 2015). Network capacity, talent shortages, high levels of regulation, sustainability targets and rate of technological change remain key challenges (Ofcom 2015). Different forms of strategic alliance between operators, and to a lesser extent vendors, are increasingly utilised but demonstrate varying levels of success (Curwen & Whalley 2004). The most common rationale is to enhance efficiency through technological synergy, for example by sharing radio access network infrastructure. A specific technological challenge and opportunity of the case organisation is to consolidate IT infrastructure, notably datacenters and legacy systems and to migrate 40% of IT services to the cloud within three years. IT savings of 25% are anticipated.

The joint venture partnership also creates a significant UK employer with strong positionality in terms of number of subscribers, network coverage, distribution footprint and network infrastructure across all spectrums. It is an active player across mobile, home, business and MVNO segments. On commencement of the study it operated under dual branding, employing a functional matrix structure which was highly project focussed; an environment which can bring particular challenges for knowledge sharing (Bresnen et al. 2003). C-level leadership changes led to an expedient review of organisational structure which was considered top-heavy. Following a rapid de-layering exercise, the new senior leadership team was strongly aligned with the more dominant partner and initiated the complex process of integration. The two year research period therefore offers coverage of a series of transformational strategic, technical and operational level changes, providing an optimal setting for analysis.

4. Research Methodology

Prior to starting this research appropriate ethical approval and informed participant consent was obtained. An inductive and longitudinal mixed methods study was then undertaken over two years, in three phases, and is sequential exploratory, emergent and recursive between its qualitative and quantitative data sources, in the form QUAL →← QUAN (Nastasi et. al. 2007). Its research components are equally weighted, with integration embedded at each stage addressing a core constituent of quality in this form of research (Heyvaert et al. 2013). A mixed methods design was selected as it best aligns with the multifaceted nature of organisational research (Cameron & Sankaran 2015) and can foreground the strengths and negate the weaknesses of a mono method approach to achieve deeper insight (Bryman & Bell 2015). Mixing methods can thereby move beyond discipline traditions (Onwuegbuzie & Leech 2005), individual researcher and/or publication preferences (Miles, Huberman & Saldana 2013).

The use of an interpretive case study is appropriate for the inductive process of exploring complex environments and emerging issues; supporting theory building from practice (Yin 1994). The content (what), context (why) and process (how) of organisational change is foregrounded, addressing critiques of many studies which consider change as a single rather than dynamic unit of analysis (Pettigrew 1985). The primary qualitative data collection techniques adopted were structured observation based on a development to the framework STROBE (Kendall & Kendall 1984), focus groups, and semi-structured face-to-face interviews. This enabled cumulative insight into the culture of the joint venture; including changing ways of working and sharing knowledge. Within Phase 1, these qualitative techniques combined with the literature review enriched the development of measures for a quantitative survey of knowledge sharing effectiveness and influence factors, which could be monitored over time.

To ensure content validity, construct measures for the questionnaire were selected or adapted from existing scales as appropriate, assessed using a 5-point Likert scale. Multiple-item measures were employed to reduce the impact of social desirability bias and enhance reliability. Results were differentiated by tacit or explicit knowledge type, moving beyond the either/or focus of many studies (Kuo & Young 2008). Discipline experts from academia and practice then carried out a face and

content validity analysis of the questionnaire. A pilot was also undertaken in order to identify and reduce errors with specification, frame, non-response, processing and measurement. Potential ambiguity regarding terms and phrasing was identified and revised accordingly. Cronbach's Alpha was then used to evaluate internal consistency with values above .70 considered acceptably high.

The dependent variables explicit knowledge sharing (12 items, α value .878) and tacit knowledge sharing (16 items, α value .911) were based on two well validated behaviour scales (Reychav & Weisberg 2009; Yi 2009). Additionally, the survey captured data on the knowledge sharing tools used by participants, many of which are mediated by technology. Amongst a range of potential knowledge sharing influences and influencers within the full survey, attention is drawn to most salient areas for this paper. These are the IT Support six item construct based on Gartlan & Shanks (2007) and Teerajetgul, Chareonngam & Wethyavivorn (2009) which achieved a high α value of .906; the twelve item Culture (normative beliefs) scale particularly influenced by Bock et al. (2005) which achieved α .845 and the four item (perception of) Power of knowledge scale at a .777 based on Kankanhalli, Tan & Wei (2005).
Secondary data from both internal employee engagement and IT/business alignment benchmarking surveys was also incorporated into the study, utilising the emergent availability of new data sources. The interviews, focus groups and survey techniques were repeated across three intervals during the two years in line with key periods of change, for example the introduction of an outsourcing agreement, whilst observation was conducted throughout and recorded using a diary. This comprehensive and integrative approach reduces a key methodological limitation of existing knowledge sharing studies which utilise a mono method to take an organisational snapshot, for example a quantitative survey completed over "*one time period*" (Wang & Noe 2010, p.126).

In relation to the study participants, attention was directed at middle managers as these "change intermediaries" (Balogun 2003, p69) span boundaries (Blyler & Coff 2003) with active and increasingly high strategic influence (Wooldridge, Schmid & Floyd 2008). They are recognised to be the key knowledge brokers within an organisation (Park et al. 2015). Finally, it is noted that the lead investigator holds a reflective practitioner relationship with the case organisation, notably specific experience in IT change management within mobile telecommunications. This supported legitimacy (Coghlan & Brannick 2007) and benefited gatekeeper access for the duration of the research.

5. Results and Discussion

Given the multi-layered, longitudinal and mixed methods design of this study alongside natural space constraints of publication, the core research findings are now discussed. These are selected on the basis of being considered to offer maximum learning benefits regarding the challenges and opportunities of information technology deployment and the optimisation of knowledge resources. A deeply integrative approach to mixed methods analysis (Heyvaert et al. 2013) involved the iterative moving between, and back and forth across, the different data sources to surface new insights (Almandoz 2014). Presentation of these findings is undertaken thematically and sequentially, unfolding in line with the emergent nature and time period of the research.

5.1 Attention to Cultural Integration is Critical

The important role of cultural integration across the partners is firstly revealed through this analysis. Positive and significant correlations were identified for the impact of culture on both tacit and explicit knowledge sharing, with a Pearson's r of .637 and .422 respectively at p<.001. At regression analysis, differentiation was associated with the type of knowledge shared, reinforcing the need to evaluate these dimensions separately. The impact of culture was positive and significant on explicit knowledge sharing with values of B .289, t 2.45 (p<.05) and r^2 .178 within a model that achieved an adjusted r^2 of .6523. This aligns with the pivotal role of information technologies to support the management of codified knowledge in particular (Zack 1999; Alavi & Leidner 2001; Park et al. 2015). The non-significant impact of culture on tacit knowledge sharing at regression can be further explored through qualitative findings.

A lack of cultural integration across the partners emerged strongly alongside early indicators of acculturative stress (Nahavandi & Malekzadeh 1988) which aligns to the heightened emotional

experience that can arise at the start of organisational change, during which time expectations can be made or equally broken (Kiefer 2002). Tension existed between the social comparisons made by employees that were far less favourable regarding the new but *"ambiguous, lethargic and distant"* organisation as opposed to former states associated with *"confidence, clarity and a sense of belonging";* a consensus view across focus groups. Indeed, during times of perceived risk and uncertainty, employees can be particularly influenced by the social information cues of co-workers to inform their personal attitudes, beliefs and subsequent behaviours (Chen, Takeuchi & Shum 2013).

Issues of ambiguous and disjointed nomenclature also evolved emphasising its importance in national as well as international joint venture contexts. As one Business User commented "*we use different terms and jargon when addressing the same thing!"* Strong desk personalisation with prominent display of branded artefacts associated with one joint venture partner further implied strong cultural internalisation, considered an example of both representation and reification. Indeed, during the first six months of the research, the past felt *"omnipresent"* yet *"lost" and "mourned"* as described in an interview with one IT Change Manager. This level of organisational memory can be expectation orientated and impact upon collective tacit knowledge sharing (Ebbers & Wijnberg 2009).

Reviewing internal secondary pulse survey data, the *Net Promoter Score* which measures employee engagement and pride was consistently below the benchmarked industry average. There was also only sporadic evidence, typically driven by individual managers, of the open dialogic communication patterns (Eisenberg et al. 1999) or emotional balancing efforts (Huy 2002) that can ease the transition over this critical period and help create shared understanding (Deresky 2010). Employee acceptance of the legitimacy of organisational integration processes and the form of the new entity itself is pivotal to successful partnering outcomes (Gole & Morris 2007). The flux, uncertainty, liminality and lack of common language and cognitive models therefore become likely contributors to the negation of a statistically significant influence of culture on tacit knowledge sharing behaviours (Smith 2000) and a possible indicator of knowledge sharing disengagement (Ford 2008).

5.2 Early Identification of IT Legacy Challenges

IT legacy was foregrounded to be a significant issue from an early stage. As elucidated by IT Service Managers, the inherited joint venture IT infrastructure was fragmented, inter-dependant and inflexible to adapt. This led to reliance on isolated individual knowledge holders and placed pressure on service availability, reliability, response times and the optimisation of technological capabilities. Duplication was identified, notably 70 applications dedicated to customer billing. One technical project manager, new to the organisation, described these as *"bolt-ons"* which should have been retired or enhanced through managed development rather than be the subject of temporary, non-stable coding add-ons. These acted as a *"sticking plaster, not a permanent solution".* A senior executive commented:

"…the more applications we have, the more complex, time-consuming and expensive it is to run our business. We need to make it simple – for our employees and our customers. It will free up time, skills and IT resource, to move from consolidation to high impact strategic innovation".

Further, a range of corporate systems and applications were in operation aligned to the global policies of both partners and their respective parent companies. There was no single, centralised web portal for internal communications. Bespoke variations were identified on the basis of location (physical/virtual), brand, function and within the boundaries of local groups. In some cases, this resulted in overlapping design, purpose and content and in others, it created disconnect across IT and Business teams with each *"going their own way"* as described by one Support Analyst. This can also lead to variance in norms, climate and associated employee behaviours in different workgroups which can impact responses to and acceptance of organisational change (Edmondson & Woolley 2003).

The lack of consistent knowledge flow and shared understanding was again compounded by differences in nomenclature between the joint venture parties and across specific functional areas, notably IT and business teams. This disjuncture aligns with internal secondary survey data that measures IT-Business alignment maturity using the SAMM framework (Luftman 2011). Results fell below a comparable European industry average of 2.74 in all areas: Communications, Competency/Value, Governance, Partnership, Scope/Architecture, and notably Skills, with an average

overall score of 2.57. This can reduce the capacity of a joint venture organisation to enact effective change (Wade & Hulland 2004).

5.3 Individual Decisions to Hoard, Hide or Disengage

A juxtaposition emerged between collectively orientated decision-making on knowledge sharing, for example a manager "*justifying my team's position by sharing what we do";* and personally focussed knowledge behaviors, notably individuals' consciously electing *not* to share. Knowledge was recognised to be personally, and to varying degrees, team owned and affording value. This was supported by the significant negative correlations found between both tacit and explicit sharing and the (perception of) power construct with a Pearson's *r* of -.329 (p<.01) and -.275 (p<.05) respectively. Similarly at regression analysis, a negative significant relationship was found in respect to tacit knowledge with values of *B* -.128, *t* -2.40 (p<.05) and r^2 .108 within a model that achieves an adjusted r^2 of .7702. For explicit knowledge, the association was not significant. Overall, these findings align with a growth in personal knowledge management (Cheong 2011). As an IT Designer commented during interview:

Due to the continually disruptive nature of change here I need to think of my own interests. It feels high risk, so I'm putting personal first. I am not giving away all the knowledge I have acquired through sheer hard work just for some newbie to take it and use it, and probably do me out of a job in the process. I'll keep it in my head or store it on my IT system or maybe on our private team KMS for later use"

This narrative was echoed across many participants, notably during phase 1 and 2 of the research. Individuals who recognised the worth of their tacit and/or explicit knowledge could elect to either withhold or hoard it from their employer to protect personal value (Vaiman & Vance 2010), at a time of perceived "high risk". Decisions regarding sharing with co-workers were more complex reflecting the nature of change experienced as an individual, and at times, as a group sense-making process (George & Jones 2001). Electing to share to the team often related to whether strong affiliation or established clan style relationships existed a priori to the joint venture commencement. This scenario is revelatory of an organisational environment centred more on *competition* than *collaboration.* The affordances of information technology were at times being utilised in a way contrary to design intention, for example to support personal or privileged team knowledge management through selective codification. This can lead to a range of knowledge hoarding, hiding or disengagement behaviours (Ford 2008).

5.4 Successful Inventions to do "IT" Differently

Project Telco60 launched during phase 3 of the research and provides an example of an effective large scale, multi-stage and multi-stakeholder IT deployment, which addresses some of the challenges identified. It was introduced to transform the IT and organisational infrastructure and its alignment fitness to benefit "*cost leadership*, *business simplicity and quality of exchange"* by early 2014. A specific objective was to achieve a 90% reduction in the number of internal IT applications in operation, addressing legacy, duplication and fragmentation issues and to build more integrated communication and collaboration channels. This required building a service-orientated architecture (SOA) with rules and standards in place to facilitate sharing of applications and development across the joint venture and its core supply chain, within a private cloud.

An integrated multi-brand platform was launched, from which a streamlined and related application set could be accessed. This necessitated close liaison between Business and System Analysts and attention to shared language (Harwood 2013) which had been a perennial problem during transition. It involved appropriate stakeholders being tasked to put forward *"the best application"* from each of the partner brands within the joint venture, reaching across HR, payroll, finance and accounting, warehouse, CRM, supply chain, campaign management and business intelligence. A sub-project was also implemented to integrate the disparate parent company and joint venture partner communication systems to create a centralised intranet hub. This was designed to aid collaboration and disseminate news, providing a single gateway to core organisational-spanning tools, from email to expenses. The ultimate aim was to provide only one instance of applications within the private cloud based SOA.

Telco60 also led to the introduction of a central knowledge management system. Reviewing findings from the IT Support scale in the primary quantitative survey over the whole two year period, a particular improvement in the positive and significant association between use of information technology and support of i) collaboration ii) communication and iii) searching and accessing was identified, both for tacit and explicit knowledge sharing. Use and promotion of a range of knowledge exchange tools mediated by technology increased by an average of 20% over the final six months of the research. Further, the internal secondary survey data to measure IT-Business alignment maturity (Luftman 2011), demonstrates consistent improvement across *all* dimensions, particularly in Skills and Communications, achieving an overall average of 2.71 and thereby moving close to the European sectoral benchmark.

Supporting this initiative, new focus was directed to key organisational relationships to negate some of the principal reasons for knowledge sharing difficulties (Solli-Saether, Karlsen & van Oorschot 2015). At senior manager level, partner roles were introduced to act as a pivotal liaison point between IT and business functions, moving beyond a traditional top-down and hierarchical approach to cross-functional communication and collaboration. Partners worked in a defined domain area, with responsibility for aligning processes, ensuring clear and consistent language use, facilitating knowledge exchange, sponsoring projects and negotiating requirements across stakeholders. Lessons were continually gained during this process, for example, a decision to regularly rotate partners across the organisation was challenged and later reversed, with the problem area richly articulated by this incumbent:

"I know breadth of knowledge is important but in this field it is the tacit, nuanced understanding of how things work, how they fit, who to ask and how to get things done that matters. By the time I accumulate this type of knowledge it's time to move on and start all over again. We weren't engaged in this decision and it doesn't feel thought-through. These roles are an opportunity to build partnership across functions, we can't waste the potential to make it happen".

Additional interventions included departmental roadshows visiting office sites away from the headquarters to build broader awareness and provide training on how to optimise cross-team interactions around the new technologies. Attention was also directed towards increasing social proximity (Knoben & Oerlemans 2006) through inter-group events alongside a partial re-design of the office environment. As an example, greater use of open plan working areas and the provision of games or relaxation space helps to catalyse opportunities for "chance encounters and unplanned interactions" (Waber, Magnolfi & Lindsay 2014). Over time, this builds more organic socialisation, collaboration, creativity and knowledge sharing behaviours that can establish norms of reciprocity (Gouldner 1960).

Finally, Townhall style monthly events were introduced to foster open communication and interaction across all levels of the organisation and potentially encourage less engaged employees to begin to reassess their environment (Milliken, Morrison, & Hewlin 2003). This offers a consistent and transparent mechanism of voice for idea exchange; scaffolding inclusive participation and contribution to decision making. It also gives employees cumulative confidence in the safety and efficacy of sharing, which can ultimately enhance their acceptance of change (Oreg, Vakola & Armenakis 2011).

5.5 Potential Limitations and Development

The generalisability of findings is a potential limitation of this research and similar studies are encouraged with more diverse samples, for example using different organisational sizes, functional units and levels of employee, and within a range of industry sectors and national contexts. In particular, it would be beneficial to explore the role of knowledge sharing in IT deployment success during the commencement of other forms of strategic alliance, notably merger as this necessitates the highest level of integration (Todeva & Knoke 2005). Additionally, findings suggest that there is significant and underexplored value in investigating group or team level knowledge sharing intentions, influences and outcomes, most specifically the extent to which these can influence individual behaviours and/or exchange within a work group.

6. Study Conclusions and Contribution

This paper foregrounds the enablement of information technology implementation and positive transformational change which are recognised as critical to organisational success yet problematic to actualise. This is particularly the case during the complex and dynamic setting of a new joint venture formation, a form of strategic partnership that is increasingly selected by contemporary organisations as a means to survive and aim to thrive in turbulent times by enacting complementary synergies. The study addresses a deficit of empirical research that explores the role of knowledge sharing in this process. It offers key areas of originality by design, notably the exploration of a national large joint venture in the mobile telecommunications sector that utilises a mixed methods and longitudinal approach. This moves beyond an organisational snapshot to surface a rich and more representative characterisation of the dynamic nature of change and individual patterns of behaviour over time. Further, both tacit and explicit knowledge are considered rather than a focus on one aspect in isolation.

Study findings consistently demonstrate that individual knowledge sharing behaviours afford a pivotal role in IT deployment success during joint venture. Core insights include the importance of achieving cultural integration and common understanding between partners, with language, cognitive models and social cues key elements in employee engagement, perception of legitimacy and knowledge exchange. Similarly, early attention to IT legacy issues, still prevalent in many organisations today, allows not only the optimisation of efficacy and focus on developing new integrative technological capacities, but can mitigate the issues of knowledge silos or lack of knowledge flow which system fragmentation and/or duplication can typically reinforce.

Identification of a high level of personal and on occasion, privileged team knowledge management behaviour was a core finding which would benefit from additional research. It is indicated that employees recognise the power and value of their knowledge which can result in protection mechanisms such as hiding and hoarding, sometimes using technology for selective codification, or to disengage from sharing practices. It would be useful to explore how this is affected by individual and group sensemaking on risk and uncertainly during different types of transformational change. As well as identifying factors that act as barriers or facilitators, a differentiation in results was found associated with the type of knowledge shared, reinforcing the need to evaluate the tacit and explicit dimensions of knowledge separately. Additionally, the research foregrounds the importance of individual employee behaviours and to a lesser extent group influences in determining desired change outcomes.

Knowledge sharing is a discretionary and value laden behavioural choice and similarly organisations cannot take for granted that individuals will hold or automatically develop a positive attitude toward change. Continual investment and improvement is required in relationship building and sponsorship, IT integration, cross-functional alignment, IT enabled dissemination and sharing structures and the provision of mechanisms and a working environment that enables voice, interaction, proximity and open engagement with specific examples elucidated in this case. This approach intersects the organisational, social, political and interpersonal dimensions of change. It is argued that employing this integrative approach to IT implementation, especially during joint venture, can scaffold employee commitment, capacity and confidence to exchange what they know. This contributes to incrementally building a shared and agile context for change success that is more compatible with the nature of contemporary work environments and can actualise partner expectations of the future outcomes of strategic change.

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