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Global virtual teams for value creation and project success: A case study

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Abstract

This qualitative study examines whether virtual projects present challenges that are different from conventional projects and how they might be more useful than face-to-face teams in delivering value in certain contexts. It takes a post-implementation and lessons learned approach to elicit the experiences of two distributed information technology projects within a global banking corporation. Findings indicate that time zone and cultural differences in particular, affected communication and team relations. Other barriers included more 'conventional' issues such as management agenda and leadership style, requirements creep, asymmetry in processes and unclear roles and responsibilities. Their presence exacerbated the relational difficulties between team members. However, success in terms of time, budget and value delivery was evident in both of the virtual projects – attributable primarily to the determination and outcome orientation of team members. The study concludes that virtual teams are useful for projects requiring cross-functional or cross-boundary skilled inputs and the key to their value creation is to have a defined strategy to overcome problems associated with at-distance cooperation.

Keywords: Distributed working; Global virtual teams; Virtual projects; Project success

1. Introduction

Herzog's [1] observation of industry's growing preference for virtual team-working follows earlier writers' argument for resource maximisation and corporate agility through cross-boundary internal and external collaborative working [2–4]. The trend for virtual teaming has fuelled interest in associated structural, operational and human asset management problems. Against Powell et al.'s [5] suggestion that virtual teams using technology as a primary enabler are amongst the key imperatives of modern businesses is Bell and Kozlowski's [6] support for the superiority of the conventionally organised team. They argue that the spatial distance in a virtual team necessitates reliance on technology for communication and impedes performance management and team development. Lee-Kelley et al. [7] discern two main themes: (1) how teams evolve, whether virtual teams differ from traditional teams in their evolutionary process and (2) how virtual teams are managed and whether distance requires different managerial techniques. Their study of eight globally distributed teams concluded that virtual teams are different from traditional teams and that managers should recognise the importance of 'soft' relational issues. Alternative strategies and tactics are necessary to compensate for that which occurs spontaneously in conventionally located and structured teams.

The question of 'How can I manage them if I can't see them?' [8, p. 81] is an on-going challenge and members are still concerned about their career prospects with reduced opportunities for social networking [9]. Indeed, two years on from their lament that our understanding of the workings of virtual teams is only anecdotal, Kirkman et al. [10,11] reported a persistent lack of 'systematic analysis'. In responding to their call for systematic research, we argue for the imperative to focus on the fundamentals of global virtual teaming to identify how they might add value and help successful project outcomes. Accordingly, this qualitative study takes a post-implementation review and lessons learned approach to elicit the experiences of two

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distributed information technology projects in a global banking corporation. We explore the structure, composition and communication/co-ordination methods used and the elements underlining virtual project success. We identify the issues and offer suggestions that might help actors overcome or lessen the impact of difficulties attributed to virtual cooperative working.

2. The case: BankCo Inc.

This case study relates to the Europe, Middle East and Africa (EMEA) region of BankCo Inc.,[1] a large consumer bank with branches in 100 countries. BankCo Inc. evolved from a number of multi-national companies. The move towards a single global brand led to the renaming of many of its country-specific businesses and the adoption of a common corporate identity and global standards (e.g. the provision of the same 'look and feel' at their many cash machines or ATMs). With the reorganisation, software support was to be provided at regional and global levels and as a result, individual businesses lost their hardware and technical support staff and significant pieces of software maintenance were outsourced.

The 'new-look' bank is divided into three major business divisions: Consumer, Corporate and Investment with retail banking residing within the Consumer division. Support services such as Technology Infrastructure (TI) which provides the management of the Data Centres are centralised and straddle the three divisions. TI's Consumer Data Centre is located in Germany and its Corporate and Investment Data Centre is based in London. Whilst the two Data Centres appear separate and distinct as divisional services, specialist teams within them such as mainframe support and communications are sited and managed either from London or within their respective Data Centres.

The EMEA region was formed following a major restructure of Consumer Banking in 2003. From the IT perspective, the reorganisation resulted in half of the EMEA region being operated from an external Data Centre in Singapore running a 'standard' software application and the other half operating from an 'owned' regional Data centre in Germany running a variety of software applications. Maintaining a common service across two distinct systems was costly and difficult to manage. The need to reduce costs by operating a standard IT application with common functionality serving the whole region but still capable of local options soon became apparent. A project was conceived to reduce the number of different types of hardware platforms in use and to provide a single regional support team. This would not only reduce licence and maintenance costs, development efforts such as mobile telephone banking and interactive voice recognition (IVR) could be leveraged across the businesses within the region.

[1] The alias BankCo Inc. is used in this paper to preserve the confidentiality of the actual participating organisation.

At the time of the decision to standardise on a regional application solution, BankCo UK was substantially into a project to migrate its current application running on AS/400 hardware and supported by BankCo Greece to another application which was supplied by a software house in India, part-owned by BankCo India. The UK was selected as the first business to migrate to an enhanced application version of the Asia Pacific (AP) regional standard with Greece (which also operated the same system) to follow the UK.

This study looks at the two migration projects which were completed in March and September 2004 respectively. The projects were especially complex as they were the first installations in Western Europe of the enhanced version of the AP standard. It was the first time that AP was deployed in another Data Centre. However as not all the enhancements were ready for the UK installation, the UK version had to retain many of the 'old' components.

3. Defining the virtual team

Unlike Henry and Hartzler's [12] early definition which made no reference to the team's temporary nature or reliance on technology, Townsend et al. [13] and Lipnack and Stamps [14] included both geographical and temporal distances and the use of telecommunication and information technologies for communication and performance. In arguing against a single definition, Bell and Kozlowski [6] maintain that team type is controlled by its characteristics, namely 'temporal distribution, boundary spanning, life cycle and member roles' (p. 16). Hence the general consensus amongst the early virtual team authors and more recent researchers such as Alge et al. [15], Balotsky and Christensen [16] and Davis [17] is that virtual teams are typified as geographically dispersed team members who communicate with each other using some variant mix of information and communication technologies. The temporary aspect of the team appears less emphasised, although Bal and Teo's [18] synthesis of other prevailing definitions included temporary existence and cross-functional and inter-organisation collaborations.

The multiple-relationships nature in virtual teams is exemplified by Cascio and Shurygailo's [19] classifications with reference to the number of locations and the number of managers involved, ranging from the single 'teleworker' working largely on his/her own at a single location to the 'remote team' which consists of a single manager of a team in many locations to 'matrixed teleworkers' of multiple managers of a team in a single location to the 'matrixed remote team' consisting of multiple managers across many locations. However, as the boundary distance at which people perceive co-workers as remote or external to their own team may be as low as a fifty foot radius [14], it is understandable that the virtual team may be more a psychological reality than a sociological entity [20]. This does imply that people are actively aware that they are part of a virtual team. This is not always the case. Initial discussions

with IT colleagues indicated that although virtual working is a daily reality for many in BankCo Inc., the majority do not seem conscious of that fact nor infer the need for a different style of working over and above their traditional team interactions.

Other writers approach the virtual team concept through the personal attributes of the team members. For example, Fisher and Fisher [21] point to the seven competences of virtual team members: a desire to improve personal knowledge, specific technical skills, a team-working approach and a strong problem solving and decision making capability. Likewise, in addition to their virtual team types, Duarte and Snyder [22] also identified the essential competencies: project management, networking, and appropriate use of technology, self-management, cultural and interpersonal awareness.

In sum, while there is some agreement on the form, structure and human characteristics of the virtual team and its members, its role in project value creation and success has yet to be fully understood, prompting this study.

4. Themes from the literature

A recurring theme emerging from the literature is the importance of communication between virtual team members and the effects of using technology to communicate. An over-reliance on a technological infrastructure can impede growth as global companies expand into regions where the necessary infrastructure does not yet exist [23]. This may explain Gibson and Cohen's [24] observation that the use of advanced technologies is 'relatively uncommon in virtual teams' (p. 404) and that email seems to be the most common tool. Bell and Kozlowski [6] and Lee [25] concur, but Robb [26] points to the arrival of a 'third generation of collaboration technology' (p. 106). Emails and conference calls are generally known as first generation technologies while online discussion boards, PowerPoint presentations, video tools and online meeting tools are second generation technologies. Third generation technology refers typically to web-enabled shared workspaces via the intranet or internet.

Time may be an issue when team members are dispersed over a wide range of time zones. The use of asynchronous technologies can overcome different daylight working but still leaves a gap between query and answer and in time critical projects this can be stressful and inefficient. Saunders et al. [27] offer four cultural dimensions of time (western linear clock time, oriental cyclical event-based time, Hindu or Buddhist conception of time as limitless and Taoist or Confucian emphasis on balance or harmonic time) in which differing senses of time and urgency in a team can prevent shared appreciation of project deadlines, work pace or rhythm and importantly, performance measures where time is chargeable. The different time views present a challenge to managers trying to coordinate work and behaviour throughout their virtual teams.

There is general consensus throughout the literature that some level of face-to-face contact is necessary - although opinions differ as to when this should take place. Cascio and Shurygailo [19] recommend that when a team is set-up, key team members should meet at a kick-off meeting to allow interpersonal relationships to form. It is unclear however, why bonding should only be the reserve of 'key team members'. Lee-Kelley et al. [7] prefer a broader and more inclusive approach since 'team members reported that for a team to achieve optimum performance it was necessary to operate initially in a face-to-face meeting' (p. 385). Burtha and Connaughton [28] add that, budget permitting, periodic face-to-face meetings should be built into the project schedule to increase leaders' visibility, enable leaders to understand the challenges facing team members, enable the forming of interpersonal relationships between leaders and subordinates, increase team members' appreciation of remote leaders' difficulties and the building of social capital and trust. The social benefits of regular face-to-face meetings are also reported by Maznevski and Chudoba [29] who see this as ultimately enriching team performance. Yet Kirkman et al. [10] argue that face-to-face interaction is not mandatory if there is trust between team members. This perspective assumes trust as enduring and static, which is contrary to the trust literature whose studies have found trust to be dynamic, and role and context specific [30–32].

Project leadership also emerges as an important theme. Davis [17] sees the global virtual leadership challenge as akin to Taoism, where the need for balance is paramount and where management uses the same communication tools as their team members so as to be able to experience first hand the challenges facing team members. There is evidence that leadership skills transcend the limitations of technology media for communication. Tyran et al. [33] report that 'emergent leaders were able to inspire and motivate' (p. 187) others using email. Tyran et al.'s finding is interesting in that it suggests the possibility of leading at a distance. A question for this study is the level and detail of interaction required. Other issues related to communication include ambiguity, lack of non-verbal cues, cultural preferences and usage, language, lack of visibility, sharing of information and time zone differences. It is possible that problems take longer to be detected and resolved because 'distance amplifies dysfunction...dilute leadership' [17, p. 48].

Other writers do not see any scope for management intervention. For example, Kostner [34] postulated that a remote leader has 'little or no power or control' over his virtual team and that control is voluntarily imposed by the members themselves. The control theme is particularly relevant to BankCo's global virtual teams, bringing to the fore Kayworth and Leidner's [35] observation of a dichotomy between members wanting and expecting strong leadership and team leaders who, faced with the practical constraints of distance and the lack of direct line role, would prefer members to be self-motivated and self-managing. An option

to overcome the hands-on-off dichotomy is for team members to assume a greater level of self determination by mastering new skills for 'self-management, virtual communication, cultural sensitivity, trust building and competence in using information technology' [36, p. 96].

It seems logical that some consideration should be given to the interaction of team members from a variety of different cultural backgrounds. Culture may be divided into national, organisational and functional. For example, Lee [25] notes that communicating by email is not a preferred choice for managers in Eastern countries such as Japan and Korea. Email's informal and largely egalitarian appeal to Westerners is at odds with the Eastern Confucian principle of respect for elders and seniors in the workplace. Organisational culture may be further divided by clan, market, hierarchy and adhocracy, each displaying diametrically opposed values characteristics [22]. The international nature of global virtual teams means that members potentially fall into different places within that competing values model – this is certainly the case with the BankCo's migration virtual teams in this study. This can result in tension amongst team members. Sensitivity to cultural issues is not just the prerogative of management as Milliman et al. [37] pointed out: 'employees on virtual cross-national teams typically do not have extensive international experience' (p. 40).

Allied to the culture theme is conflict and its management in virtual teams. Montoya-Weiss et al. [38] looked at the five traditional conflict management modes: avoidance, accommodation, competition, collaboration and compromise (p. 1253) and evaluated how different the effect might be on virtual team performance and the impact 'temporal co-ordination' might have on that effect. Following McGrath's [39] TIP theory (time, interaction and performance), it is possible to employ mechanisms that can alleviate conflict and stress such as structured schedules with defined deadlines, synchronising the pace and effort of team members and task-specific allocation of resources. However, feedback from communications company AT&T on the lack of direct supervision and the challenge of keeping the remote worker as an integral part of the office team emphasises the difficulty of detailed at-distance supervision or managerial direction.

Trust is a topic that comes up repeatedly in virtual team literature. The impact of the lack of social presence and context inherent to face-to-face environments on trust development within the team is highlighted by Jarvenpaa et al. [40] and O'Hara-Devereaux and Johansen [41]. Jarvenppa et al. [40] conceptualise trust as either a rational form of trust based on self-interest or from a social perspective, based on one's moral duty. Some might assume a pragmatic stance of assuming trust development through the deployment of practical techniques such as active listening and follow-up, creating knowledge suppositories for all to use and adopting a management structure that is clearly defined yet flexible. Coutu [42] presents a three-staged trust development framework grounded in increasing understanding and awareness from extended interactions: (1) deterrence: results are based on fear of the consequences for not performing, (2) knowledge: results are predictable based on better awareness of team members' abilities and (3) identification: results are based on empathy and shared values. This model has yet to be proven in the virtual team and despite Herzog's [1] study on trust in a collaborative team showing trust as perception of self, perception of other team members and perception of other stakeholders, it fails to address the central question of how trust is built and how it is transferred from the interpersonal to the team.

Of importance to this study is the extent to which virtual teaming can assist or hinder project success. However the Oxford English Dictionary's (1991) definition of success as 'the accomplishment of an aim; a favourable outcome' (p. 1444) lacks precision for use with projects. Traditionally project success was founded on effective project monitoring and control and defined by the 'iron triangle' of time, budget and quality. More recently, Roebuck et al.'s [43] practical advice is to (1) define the team's objectives (2) assess agenda items (3) identify appropriate members (4) establish a team leader and (5) leverage team members' knowledge and to ensure that knowledge is shared across the team. This approach assumes the project as a self-contained entity protected from externalities and a willingness to share and not to act selfishly. It also contradicts Kostner's [34] low-power argument of leaders in a virtual team. With increasing awareness of the project as a part of the work and societal environments and whose achievement cannot be limited to those performing the project, Turner and Müller [44] contend that success should include other 'softer' interpersonal aspects such as leadership style, customer evaluation of the value added or benefits delivered by the project and overall stakeholder satisfaction.

Others question the effectiveness of artificial communication media as effective replacements for face-to-face meetings and their affect on creativity, morale and decision-making quality [45–47]. Proponents of face-to-face interactions would suggest that value and success as constructs are perspective dependent and multi-dimensional. Lee-Kelley et al. [7] lead the argument that aside from standard industry reference to the 'iron triangle' of time, budget and quality performance, qualitative variables (the project 'intangibles') are also critical for success. In particular, Davis [17] specifies relationship, planning and role clarity as important for project progress while Herzog [1] posits that measures of project success should include being on time, being within budget, delivery a 'quality' product, having a satisfied customer and the level of personal satisfaction gained from working on the project. Both Davis [17] and Herzog's [1] postulations have captured in part the 'hard' and 'soft' aspects of the critical factors for project success. Herzog's [1] definition is still largely based on the assumption of the project in its own environment with clearly defined boundaries. Given the multiple location, multiple leader and membership nature of BankCo's migration projects, Duarte and Syner's [22] seven factors model (technology, HRM policies, training

and development, standard organisational and team processes, organisational culture, leadership and leader-member competencies) would appear to be more relevant as success indicators.

Although not foremost in the virtual team literature, cost control is a critical component for global corporations in their strategy to sustain competitive advantage. For a corporation such as BankCo Inc. which has business structures operating in over 100 countries, many of which provide similar services (for example, in retail banking), it does not make economic sense to support a variety of information technology applications, nor does it makes sense to maintain large pools of IT personnel in each business. For BankCo Inc., there are obvious cost saves to be made by moving to a standard retail banking application, which can be maintained by staff based in low cost regions of the world. Competitive advantage is served by enabling a business to react quickly should an acquisition takes place. The ability to rapidly consolidate the systems of an acquired bank means that any potential cost efficiencies through the removal of duplicate functions can be achieved in a shorter timeframe while allowing the bank to continue to scan the environment for further acquisitions.

Our literature review has yielded numerous obstacles in virtual teaming, primarily whether at-distance communication and coordination can engender team identification and social bonding for value performance. Associated difficulties include culture-based differences in the conception of time and urgency, the nature and structure of globally situated projects on leadership, control difficulties and possible conflict from ambiguity and misunderstandings with reduced physical cues and social praxis. Of particular interest to this project is how these factors can affect project outcome evaluation by team members, especially in terms of valuable benefits delivery.

5. Data collection and analysis

This project uses a case-study approach to explore 'how' virtual teams operated, 'why' one project appeared to be more successful than the other and 'how' possible solutions such as personal development training might be used to improve project success. The principal source of data was textual analysis of semi-structured interviews with those close to the projects. The main 'players' identified for this case study were the two TI Data Centres, Asia Pacific Consumer Regional Technology (ATO) as the software supplier and EMEA Consumer Technology (ECT) as the facilitator. Each distinct team within the major players had a project manager and there were also Implementation Managers, Conversion Managers, Testing Managers as well as a Project Management Team overseeing each of the implementations. Although the case study projects actually involved hundreds of IT personnel, only those at the project manager level were targeted for the purpose of this case study. Following a small pilot of three interviews, a total of 22 invitations were sent to project managers from across the participating units and known to have worked on the migration projects. Eleven accepted, six gave a tentative 'yes', one declined outright and four did not respond. In addition, the ECT project manager and the ECT IT Director were also approached. Of the total of 16 definite and possible 'yes' replies, 11 interviews actually took place at the close of the two migration projects and formed part of the post-implementation review process.

Permission to tape the telephone interviews were obtained at the start of each interview. A small conference room with a speaker phone was used for each interview and the conversation was held over the speaker phone with a dictation cassette recorder running. Interviews lasted between 60 and 75 min. An interview guide form was also used for each interviewee registering the interview date, start and end time, informant's name and additional relevant notes on each question. The cassette tape was imported to an MP3 computer file and transcription was made from the MP3 file either by listening and typing or through speech recognition software. Both transcribing approaches took around 8 h for each interview yielding between 6221 and 11,777 words. Data analysis and interpretations were triangulated against the documentary evidence of post-implementation review and lessons learned reports.

The themes gleaned from the literature provided the key topics for the interviews. For analysis purpose, data from the pilot interviews were coded under three distinct categories: (1) the concept of global virtual teams (2) success and criteria for measurement (3) issues, challenges and solutions. The Category Cross Reference was rationalised by rolling up minor categories into their major category and a Pilot Category Matrix was created and converted to a table with columns and tested by re-coding the three pilot interviews again to check for missing items. The final interviews were then sorted by group and categories and coded using the matrix tables. Each major category could now be accessed and assessed for frequency, content and consistency of view, both within and across teams. Preliminary results were easily discernable by category and supported by a list of potential quotes to back up the findings. The final report is presented below by major category.

5.1. Structure, composition and communication

The first objective of the study was to investigate team structure and composition of BankCo's migration projects to ascertain the extent to which team members were removed from their day-to-day position, their awareness of being part of a distantiated team and its effect on their normal working practice and ability to contribute positively to their project. An initial observation was the multitude of traditional teams within the larger global virtual team. This local-global structure and composition might present challenges that are unique and different from either a fully co-located team or a distinctly virtual team. We go on to examine the primary and secondary communication

tools used by the team members and their use of face-to-face meetings.

For BankCo EMEA a rollout of the end-state IT applications in any specific business mean the involvement of many different teams that are brought together for the duration of the project as a global virtual team. Each component team is generally small, highly productive and has gone through the traditional team building phases of forming, storming, norming and performing. Although the individual groups are conventional co-proximate teams, they work to the requirements of and in cooperation with other groups from across the region and beyond in the larger global team structure. Thus BankCo's global IT teams may be described, using Cascio and Shurygailo's [19] team classifications, as a number of matrixed remote teams. Two global virtual teams were created for the UK and Greece migration projects. Component teams were seconded to the virtual teams from the EMEA Consumer Technology (ECT) department in the UK, the Asia Pacific Technology (ATO) department in Singapore, the European Data Centre (EDC) in Germany and the respective businesses in the UK and Greece. Most team members had other on-going project commitments and were not full-time on the migration projects; indeed, some were assigned to both teams. The matrix structure meant that most members maintained their management reporting lines and were accountable to the project managers only for their specific inputs into the project. It was acknowledged that dual reporting presents additional difficulties especially when prioritising tasks and resource allocations.

Table 1 shows a high level of movement within the matrix structure. This itinerant approach requires individuals to be flexible and able to assess and adapt to different local work practices. Three individuals reported that they had also matrix reporting lines outside of their traditional manager. Unsurprisingly, team members from the business groups changed role again post-implementation and all IT members from the old support teams were reassigned positions within the bank.

Of particular interest is the apparent lack of awareness and concern about the team structure and mode of work. Although operating in a virtual mode for many years, only half of those interviewed admitted that they knew what the concept of a global virtual team means. One of those who said he was familiar with the term had only a vague idea. Their apparent ignorance highlights a gap between practice and theory. While industry observers and academic researchers ponder over the probable issues with virtual teaming, individuals as 'doers' are more pragmatic and focused on performing rather than hypothesising the implications of the way their project or team is organised. That being said, the co-location of the UK team members in a discrete area away from their previous work stations appeared to have improved morale. Co-located working stimulated the traditional team formation process of forming, storming, norming and performing which in turn, enabled identification with the team. However, the move to allow co-location might have occurred too late to include sufficient business team members in order for them to enjoy the team development process. As a result, several informants highlighted the lack of commitment to user-acceptance testing because of a failure to re-prioritise the migration project ahead of other undertakings. While individuals seem to have developed coping mechanisms, an early conclusion is the beneficial effects of role stability, limited project changes and physical proximity for social bonding and commitment building.

Another observation was the difference in team organisation. The UK team was organised by process whereas the ATO teams were organised by product. Informants reported this to be an issue operationally. Those in the UK who were able to follow a process through its life cycle considered their team colleagues in ATO as lacking since they did not possess a complete end-to-end knowledge of the entire system. The tension between the two did not ease in spite of UK's attempt to reorganise themselves into the ATO's format. Team organisation, supporting infrastructure and abstract systems need to be perceived as enabling or adequate for cooperative performance.

ATO was the target for much criticism in their failure to communicate: "within Singapore there are three different entities and they don't talk to each other". From the interviews and internal documentation it was clear that the ten or more product processor teams tended to work in silos even within one of the three major ATO entities. This preference gave rise to perceived territorial issues and although steps were taken by ATO management, progress was slow: "it is better than a year ago, but still not working". The problem did not replicate itself in the Data Centre teams despite being separated between London and Dusseldorf, indicating a cultural explanation rather than difficulties associated with the mode or manner of communication. The team members in the Western Data Centres are more experienced and appreciate that the high task interdependency in migration projects demanded voluntary engagement by those involved. Emerging from the interviews was the Oriental concern about 'losing face' which could have prevented open admission of difficulties. Pressure on

Table 1
Maintaining roles, managers and other projects

Informants	A	B	C	D	E	F	G	H	I	J	K	Total 'Yes'
Same role	Y	N	N	Y	Y	N	N	N	Y	Y	Y	6
Same manager	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	10
Other projects	Y	Y	Y	–	Y	Y	–	–	–	Y	Y	7

project progress meant focus was on milestone delivery and the silence was interpreted by their Western colleagues as a negative tendency. From our discussion so far, any project delay or poor performance is not about virtual teaming *per se* but attributable to a host of barriers such as morphing structure and team composition, including shortfall in knowledge and skills, and communication difficulties from cultural differences.

In line with Gibson and Cohen's [24] finding, the email and telephone were also the primary communication media for the BankCo migration projects. Although Lee's [25] observation of the cultural resistance to use email was not obvious in this study, informants from ATO did comment that the level of conference calls were far in excess of previous implementations. They felt them to be time consuming and not always productive, thus further cementing their Western colleagues' view of an innate unwillingness in ATO for open communication. Although the literature has pointed to language use difficulties in global projects, this is unlikely the case with the Singapore project members given their strong English education foundation. The size and mix of the global team and differing HR practices and holiday seasons across the organisation also meant that there was always someone on holiday and emails stood waiting for his/her return. The consensus amongst informants was that the organisation is poor at managing Microsoft Outlook as a tool and the tendency for people is to use emails rather than speaking on the telephone. Both the UK and Greek businesses recorded daily mail levels ranging from 80 to 150 per person per day, prompting one of them to describe email as 'hell'. It is possible that individuals who are used to working virtually no longer need to communicate orally. Alternatively, the informal nature of emails is a convenience mechanism where project workers under pressure can quickly compose and send an email query and get back to work without waiting for a reply. A darker possibility is that it could indicate a low-trust culture where colleagues feel the desire or need to preserve some written record of queries and decisions inter- intra-teams in case of dispute.

NetMeeting rated highly as a communication tool although not everyone was familiar with it. When all non-essential business travel was banned following the SARS outbreak in 2003, NetMeeting became invaluable as a communication tool, allowing the UK Functional Specification reviews to be performed remotely. However, there was general agreement that while a substitute for face-to-face meeting under the circumstance, it cannot be used as a permanent replacement. Test Director, was also highly rated although senior managers were critical that team members continued to send emails to raise problems: "If we are going to use Test Director then we should use it, not send emails asking people to look at problems as well." Lotus Notes was criticised by most as not satisfactory for a wider audience and was seen as ATO specific. There was also general agreement that the Web has great potential but it was not used in practice. Hence while awareness of new-generation technologies was high, their application was spasmodic and only as temporary stop-gaps. Informants still exhibited a preference for face-to-face interaction and the perceived failings of the new-generation applications are strong barriers to their full-adoption.

Although Greece enjoyed fewer face-to-face meetings with ATO than the UK, it reported little detrimental effect on the eventual project outcome. It was considered mandatory however, for project re-planning or re-scheduling where clear understanding and buy-in to the changes are essential across the team: "when we did re-planning, we invited Ti, ATO and the business and sat everyone in a room to agree the next steps". This suggests the need to differentiate the purpose and mission of co-located meetings and possibly to rank them according to their operational necessity or impact, while mindful that physical presence allow human beings to mingle, share and empathise challenges and to build mutual rapport. Cultural diversity as a barrier to team empathy and interpersonal relationships cannot be overlooked.

5.2. Project success and value delivery

Another aim of this project is to ascertain how success is actually measured in practice. Both the UK and Greek projects experienced slight project delays. While management had insisted on an early completion date for the UK, they were willing to accept delivery a couple of months later in the same quarter. Being aware of the later deadline members' response was to 'play along'. In Greece, with the Olympics looming, it was considered too risky to change systems in the middle of such a high profile event and a more realistic deadline was set with two months contingency explicitly built into the baseline plan.

Both the UK and Greek projects went live with known issues and still suffer from stability problems, but those who had worked on the projects assessed the UK to be of a lower quality than Greece and that it was below personal and customer expectations. Methods of measuring development status based on number of open issues can be a reason for buck passing. ATO noted that "we rate the success of a project on the number of production problems we have". Although the theoretical criteria for completion of each phase in the UK were defined, they were not observed. It was unsurprisingly therefore that Greece had apparently fewer post-production issues than the UK. As not all the enhancements were ready for the UK installations resulting in the UK version consisting of old and new elements, it is possible that the quality and expectation gap is attributable to something more fundamental: aggressive end date, poor project scope and specification. Feedback from the business team related to a mismatch between needs and cost: "I think what the business wanted was a cheaper system that was easier to change and would reduce their operating costs [whilst having] more functionality", instead they ended up with a system that was regionally specified and quality was compromised. Another issue

raised by the UK business was the underestimation of the new system's running cost.

Interestingly, while the Greek project also suffered a small delay, it was excused on the basis that the delay allowed testing and training to be completed which had a positive impact on the perceived quality. "Greece was more successful than the UK, the cutover was very smooth, no card and PIN issues; better because Greece had more people available and applied them to the project, performed better testing, and the delay until after the Olympics gave them time to clean up remaining issues". In addition, the Data Centre noted that: "Greece went a lot smoother from our point of view. We were familiar with the set-up, the people and the lines of contact, making it easier to fix problems".

Despite the delay, the UK project spend was reportedly under budget while Greece was just on budget. Naturally team members were suitably pleased with the results but senior management revealed that contingencies were built into the budget unbeknownst to the team members. This somewhat deflated their sense of achievement. The reason for the different treatment is unclear although senior management in their post delivery review defended their decision as prudent since there was no known showstopper at the time of planning for the UK project. Nonetheless, the negative evaluations forced senior management to argue in defence of the UK, pointing to the relocation of the Call Centre just prior to migration as a key problem and that the project somehow became a convenient handle on which to hang every problem that arose: the "UK was portrayed as a disastrous implementation, which I don't accept…. Within a month we'd cleaned up all the post production issues" and negative comments were "10% to do with the EBS implementation, 90% with the Call Centre". The prevailing management style appears to be outcome rather than relation focused with a strong inclination for setting tight targets. It could be argued that inconsistency in management expectations effectively set the UK project to 'fail'. For all its faults, one UK business informant reported that "users are happier with the new system", suggesting that from the users' viewpoint, the project did meet expectations and the supposed quality gap was not as critical as the developers would have it.

Although informants from the regional ATO, ECT and TI teams had found the projects challenging, they also derived personal pleasure and satisfaction from working on them. Conversely others from the business teams confessed to being under pressure and were stressed because of the 'aggressive' delivery deadline. Despite their more relaxed schedule, the Greeks gained little personal satisfaction from the project – a case of the glass being half full or half empty?

One ATO's use of the collective noun in his comment "we felt very happy, proud" reflected the Asian inclusive, team-based culture. Most of the Western informants took the question on 'personal' motivation at face value, using 'I' to indicate their own evaluations: "I enjoyed working on these projects"…. "I was motivated" or "I didn't enjoy working madly"…. "I only enjoyed it when it was over". As the split between Western and Asia informants was pretty even, the researchers concluded that Western colleagues' orientations are more individualist and self-focused than those from the East. Cultural diversity may explain how those in the Western Data Centres saw their Asian colleagues as inferior to them, being less experienced, of lower skills and resistant to open communication. As senior management were also mainly from the West, they tended to identify with their Western colleagues, interpreting the self assessment of Western motivation as a major success factor and attributing it to the BankCo's 'culture' of "people working together to get things done, people having pride in their work". This rose-tinted glasses interpretation is problematic as it ignores the Asian perspective and effectively glosses over the inherent differences between the cultural groups.

6. Key issues identified

6.1. Management agenda and decisions

Senior management's game-style approach of driving the projects to finish early while secretly allowing more time and budget could have contributed to poor design decisions. Although the UK customer base was fairly small and a nine months project life would have been sufficient normally for ATO, UK transaction volumes were very much higher than comparable businesses and the service level expectations by UK customers were also much higher. Had more realistic timelines been given from the outset, certain design decisions could have been taken and more time spent to finish the UK components which would have made a difference to the quality of the UK delivery. As a result, members were disenfranchised by management's deliberate 'miscommunication' and were adamant that management joined conference calls unannounced to 'listen in'.

6.2. Requirements creep

Requirements were changed throughout the projects and the UK changed their whole migration strategy from ORBIT to EBS. Greece had to deal with changes that were outside of business control such as changes dictated by the Central Bank and by the local network. There was also a constant stream of minor changes being requested via emails by both businesses; to which ATO generally acceded. At the review meeting, the problem of coping with numerous changes was highlighted, leading senior management to decree that requirements creep by emails and not following the normal project change rules are not to be accepted for future projects.

6.3. Asymmetry in processes

EDC facing higher costs per FTE were keen to automate computer operations as much as possible while ATO with

lower FTE costs continued to rely on computer operators to initiate batch processes. This had a major impact on testing when it was discovered that EDC were not geared up to provide out of business hours testing support. ATO developers were also unfamiliar with the tools – issues caused by the two sites running different versions. The lessons learned report logged this as a major issue and recommended detailed records of all tools in use at each site, including the version number.

6.4. Unclear roles and responsibilities

As a result of a lack of clarity in roles and responsibilities and an absence of effective communication early on in the project life cycle, 'passing the buck' was common especially within the ATO: ''people pass on problems too quickly, take a cursory look and say it's not my problem and pass it on''. ATO had high expectations of what the Data Centres should provide – a view not shared by the Data Centres. There was confusion over the contribution and jurisdiction of the project managers, relationship managers and especially the ECT which was seen as unhelpful and a distraction as they tended to get ''in the way and kicking people, we struggled to understand the value they were bringing''. The matrix format added to the problem as people moved in and out of the project or changed roles within it: ''sometimes you are responsible for things and you don't know that they have been assigned to you''. More importantly, there was no logical single global team leader. The project operated with a network of seemingly autonomous teams reporting to their traditional line managers and although the business manager was seen as being 'in charge', he was really only accountable for the budget and on-time delivery of the project. Buck-passing was particularly bad in the early stages of the UK project. When something went wrong, it was always someone else's fault. Most of the finger pointing was between ATO and the European Data Centres. Greece had to deal with the reluctance of teams within ATO to 'own' their problems. As a result issues were passed backwards and forwards between teams before eventually all the people that were involved had to get together to work through the problem. Those in the Data Centres were particularly peeved that the network was blamed frequently and that unnecessary network checks had to be performed repeatedly before the application teams would accept that the problem was with the software.

6.5. Time zones

With so many people working across the continents, time differences were a natural problem. The flexibility of ATO in working extremely long hours meant that queries could be emailed or telephoned through to ATO from the West during the latter's business hours and be picked up and dealt with by the time the Western colleagues returned to work. The business could then test and leave another list of issues for Singapore to resolve. However, it was observed that there was an unfair expectation by those in the West that Singapore was available 24/7. Conference calls often kept the Singaporean staff in the office way past midnight but if clarification was needed by Singapore, they had to wait until 5 p.m. their time before they could contact any body in the West. The Greeks' reaction to the time zone problem shows a lack of empathy between the West and the East: this ''was a problem for Singapore, not for us''.

6.6. Over-communication

Contrary to the literature's expectation of poor or sluggish communication between distanced workers, the huge volumes of email and conference calls for the migration projects were almost unmanageable. From the available documentation the motivation for communicating appeared to be grounded in a mix of keeping others informed and keeping documented proof of decisions. Issues with email ranged from being too short and terse to endless mail ping-ponging forwards and backwards with the text of the previous message attached which, when printed, could amount to twenty pages or more. The sheer volume meant that not all emails could be read or fully digested. The recipient or distribution list was not always appropriate so that some people who should have been included were overlooked while others who were only peripheral to the subject under discussion were included. Senior management were unimpressed with the over reliance on emails and concluded that meetings should, in future, be properly organised, minuted and an action list produced. They were also critical about the long and frequent conference calls (some lasting 4–8 h) although the business felt that conference calls were an important substitute for face-to-face interaction. Project life cycle documentation was also seen as lacking and not kept up-to-date. An interesting observation is that language-use difficulties were more noticeable with other European countries such as Germany, Spain and Italy as they joined the programme, rather than ATO. Indeed, at technical meetings with a predominance of Eastern members, they were able to switch to a common first language for easier explanation of concepts. Accent was more of a challenge than language-use – which also partly explains the use of emails.

6.7. Dissonance

It would be fair to say that dissonance rather than outright conflict was noticeable. Pressure from meeting the tight deadlines created tension between groups and subsequent analysis had shown no intention to offend, but meetings could become very tense and feelings running high – on one occasion, the UK team actually walked out of a meeting having taken exception to something that was said. There was small amount of email 'flaming' but the situation never got out of hand. Bi-polar incidences between Greece and ATO and UK and ATO were evident. For

example, Greece was frustrated by ATO's Eastern 'calm' and the UK interpreted ATO's guarded responses as 'antagonistic' and self interested.

6.8. Cultural differences

Cultural differences between British and Asian colleagues were thought to be 'typical' and transcended any difference in organisational culture. Difference in work ethic between East and West was highlighted with agreement that although those in the West worked very hard, those in the East had worked longer and more socially unacceptable hours. Senior management's reaction at the close-out meeting was to caution "the need to show respect. It's not part of the European culture, so we should not expect it of them". The non-confrontation Eastern culture meant ATO not refusing change requests but were unable to fulfil them and that failure was viewed as a falsehood by the more straight-talking West: "these guys are lying continuously, but they say it's a part of their culture, they don't want to disappoint you". Interestingly senior management felt that the West–East divide was not so much a people issue as differing concept of quality: Western approach is to find and fix as many problems as possible prior to implementation whereas the Eastern wait-and-see approach is to get the system installed and then go back and fix problems as they arise. They did concede that a strong hand with the East worked less well than gentle coaxing: "you cannot challenge [ATO] people in public; I'd never appreciated how strong it was – my usual screaming and shouting just didn't work". Of note is the general consensus that culture is hard to change and that for multi-cultural teams to work well together, different management and relational strategies are required.

6.9. Trust

It was noted that temporal and cultural issues impacted the building of trust. While language was not a problem per se, ATO found the UK to be more formal in their use of written language with a predilection to explicitly re-state that had been agreed in phone conversations. This implicit lack of trust indicates how the UK was responding to the Eastern desire to please by never refusing a request but not honouring the agreement: "the major problem with ATO is when they say they will do something, and then they don't do it". Both UK and Greece were also frustrated by ATO's tendency to avoid answering a question fully. The UK confirmed that they had a problem with ATO's perceived commitment and reliability: "people are sceptical whether the team can deliver". Even senior management accepted the need for extended interaction and understanding: "the more often I go out there, the more they trust me". Positive steps were taken in the latest projects to aid the relationship building process through more face-to-face meetings.

6.10. Training

Half the interviewees were sceptical that training could benefit global virtual teams. Some doubted the ability of training to change inherent cultural style and half saw the need to train to improve communication and cultural awareness. There was also agreement that training is clearly needed for phone and email usage: "anything that can make your communication more effective, because these are our major means of communication". However, cultural awareness is not seen as easy to address: "I know what the problem is, but I don't know the solution". The general agreement is that the ability to work at a distance with colleagues from diverse cultural backgrounds came only with experience and is part of the "on the job training".

7. Conclusion

By examining the fundamental issues facing global virtual teams, this study has produced insights which should be relevant not only to the corporation under observation, but also broaden our academic understanding of the practicality of at-distance working on project success and value delivery.

An emergent image is that individuals used to working in global virtual teams are not overly concerned about the geographical spread or complex mix of team members. This does not mean that they are completely at ease with at-distance working; only that members fail to identify difficulties as unique to virtual project working. But working virtually is more an imposition than from personal choice as participants were quite conservative in their deployment of communication and project management tools, preferring still to engage face-to-face. External factors such as SARS and the need for cost containment curtailed meeting opportunities across the teams, forcing members to accept alternative methods.

Against an overly optimistic end-date set by senior management and morphing team composition and roles, both projects were successful in the conventional sense of timely and to-budget delivery. Although the consensus amongst the team members was that quality (particularly testing) was an issue for the UK project, there was no negative comment on functionality and reported user satisfaction indicated valuable benefits delivery. Both projects had to work around externally imposed problems such as changes required by the Central Bank for Greece and relocation of the Call Centre for the UK. The pressure of working against a tight deadline and with numerous distanced colleagues did not dampen the commitment of the team members and most (apart from the Greeks) drew personal pleasure and satisfaction from the projects. Managers should not underestimate individual professional identity as a factor for success. Therefore, in line with Herzog [1] and Westerveld and Gaya-Walters' [48] conceptions of project success, the case study projects were successful in vary-

ing degrees (1) in meeting overall performance criteria of time, budget and functionality, (2) meeting user requirements and satisfaction, and (3) project team satisfaction and self-assessed success. Data was unavailable to evaluate suppliers' satisfaction and other stakeholders' satisfaction. It could be said that the two projects succeeded (the UK in particular) despite their senior management, whose decisions and leadership style are open to question.

The case study has found that as workers become more accustomed to virtual team-working, many of the anticipated difficulties become increasingly unimportant for their performance – albeit that face-to-face interaction remains valuable for trust and relationship building. Given the size and scope of the two projects (e.g. ATO alone had 10–20 teams involved with the two projects) and the co-dependent and iterative nature of the workflows, virtual teaming offers these and similar projects economic and operational advantages through savings on travel and related costs and the ability to hold large meetings using technologies such as web or video conferencing. However the case study evidence supports the literature that actual use of communication technology lags behind technical developments. More could be done (such as concurrent working via online project tools) to encourage people to develop greater confidence on the suitability and dependability of the new technologies.

The list of issues appears daunting but on closer inspection, only time zones affecting communication and coordination, and cultural differences impacting on team relations and dissonance/conflict may be directly linked with the geographical and temporal-distance features of virtual teams. The remaining factors of management agenda and decisions, requirements creep, asymmetry in processes and unclear roles and responsibilities, although barriers are also applicable to conventionally structured co-located teams and not unique to virtual teaming. That being said, their presence adds to the challenge of virtual projects. Informants recognised the importance of deadlines and there is no indication from the study of culturally different approaches to time. However, although ATO members seemed willing to work longer, unsocial hours, this was not reciprocated in the West.

Therefore in closing, we conclude that virtual teams are useful for projects that require cross-functional or cross-boundary skilled inputs and the key to their value creation is to have a defined strategy in place to overcome the issues highlighted – especially the time zones and cultural issues (space does not permit an extensive review of all the possible strategies). While communication could be seen as a traditional team issue, the problem is magnified by distance, cultural diversity and language or accent difficulties. For migration or similar large-scale projects, personal project management competency, appropriate use of technology and networking ability, willingness for self-management, cultural and interpersonal awareness are fundamentals of a successful virtual team.

An obvious strategy is to raise cultural awareness and empathy through (1) careful team selection so that every global team will have at least some members who have prior distanced-working experience and who can help other global members new to virtual projects deal with possible language, accent or attitudinal differences and (2) tailored personal development programmes and team-building exercises. Project success may be achieved by making certain that appropriate training and access to computing and communication technologies are available and crucially, that members' efficacy and willingness to communicate are actively encouraged. Any usage monitoring to avoid excessive reliance on one or a combination of media technologies must be open and transparent. Quality documentation and timely updates shared over the intranet is another positive step to improve dissemination, keep everyone informed, reduce dissonance or conflict and aid project performance. Adopting a more structured project management approach can help provide role clarity and increase predictability in expected behaviours and quality performance. Other strategies include the possibility of shift-work, providing sufficient opportunities for face-to-face meetings and also use of more cue-laden communication modes such as video-conferencing. Finally, contrary to Kostner's [34] assertion of the low-power of remote leaders, this study has found that management agenda and interference can jeopardise quality delivery. Nonetheless global teams such as the BankCo's migration projects clearly need an identified project leader at the helm who has the authority to drive and coordinate project progress across the numerous sub-groups.

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