AN INVESTIGATION INTO CHALLENGES FACING DISTRIBUTED TEAMS: CASE OF SOUTH AUSTRALIAN CONSTRUCTION PROJECTS*

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Abstract

There is increasing momentum within the construction industry to deploy distributed teams on projects, yet the major challenges that companies face for managing teams in distributed arrangements has yet to be explored in the construction context. Driven by such need, this study is intended to present an account of the major challenges encountered throughout the life cycle of offshore outsourcing arrangements within the South Australian construction industry. To this end, the study describes the observations made within the natural contexts of one construction project in terms of the challenges to the success of deploying distributed teams for outsourcing of works. Discussions remain in dialogue with relevant theories and the pertinent literature to explain the interpretations and lessons learned and to underpin the conclusions made. It is contended that this study contributes to the field by providing an illuminating insight into potential challenges facing distributed teams being implemented in outsourcing tasks in construction projects. Discussions also offer practical guidelines for construction project managers and assist them in dealing with potential challenges of offshore outsourcing through the lenses of distributed team working principles.

Key words: *Challenges, Distributed teams, Virtual teams, Construction industry, Project management*
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Introduction

Construction project teams are increasingly utilising distributed teams for delivering projects (Henderson, 2008; Ramalingam et al., 2014) inasmuch as the construction industry is not a local industry anymore due to the pressure from globalisation. As such, a large number of construction firms specifically in developed countries are moving towards higher levels of internationalisation in order to benefit from the global opportunities. Consequently, construction companies in developed economies (e.g. Australia) are transferring their operations to the developing countries, with lower running costs and much more opportunities in terms of skills and talents (Horta et al., 2013). In essence, it is becoming imperative for construction organisations to adopt distributed teams in order to deal with the challenges of the contemporary business environment (Chen and Messner, 2010).

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Given such growing prominence of distributed teams in construction projects, possessing the scientific know-how pertinent to implementation of distributed teams becomes very relevant as urged by Vorakulpipat et al. (2010). That is, for achieving the desirable outcomes out of deploying distributed teams organisations have to predict and overcome the challenges through implementing effective managerial strategies (Yen et al., 2002). On the other hand, implementing distributed teams successfully within the construction context requires an in-depth understanding of the unique challenges that are not necessarily akin to the challenges encountered in face-to-face teams (Hosseini and Chileshe, 2013).

Against this backdrop, construction litearture has been criticized for the scarcity of studies conducted about distributed teams (Chinowsky and Rojas, 2003; Hosseini and Chileshe, 2013). Moreover, practitioners cannot rely on the results of the studies from other sectors of the industry due to the obvious specific approach of the construction industry towards innovative methods (Love et al., 2001) such as distributed team working. This implies that knowledge on distributed teams should be created within the natural context of the construction industry. As a result, the constrcution industry has remained in need of creating knowledge to supply the industry with essential information of the challenges faced in deploying distributed teams on construction projects (Hosseini and Chileshe, 2013). This has been the driving force behind conducting this study as described next.

Literature review

Peters and Manz (2007) defined distributed teams as teams in which members are located in more than one site and their work is extensively dependent on information communication technology (ICT) as the main channel of communication. For the construction industry, distributed teams could be defined as "groups of geographically, organisationally and/or time dispersed intelligent workers with different skills and in different positions of the hierarchy heavily relied on ICTs to accomplish engineering tasks which for all are held accountable" (Hosseini and Chileshe, 2013, p.1103). Distributed teams within the construction industry have been treated as the suppliers of the projects in the form of a number of offices scattered around the globe supporting the central lead office (Chen and Messner, 2010; Iorio et al., 2011). Due to the specific attributes of distributed team arrangements including their dispersed structure and heavy reliance on informatin communication technology, organisations should have a deep appreciation of the potential chalenges facing their implementation prior to adopting them in their working procedures e.g in offshore outsourcing projects. Evidence has demonstrated that overlooking the challenges facing distributed teams and failure in tackling such challenges would end up in disappointing results with distributed teams (Mukherjee et al., 2012).

Against this backdrop, very few studies have investigated the challenges facing distributed teams within the construction context as pointed out by Hosseini and Chileshe (2013). Noneteheless, there is consensus among majority of available studies e.g. (Chinowsky and Rojas, 2003; Joseph, 2005; Chen and Messner, 2010; Hosseini and Chileshe, 2013) in regards to the prominence of a number of general challenging areas affecting disrtiubuted teams in offshore outsourcing porjects as the items illustrated in Table 1.

Table 1. **General challenging areas facing distributed teams in the construction industry (Source: authors after Hosseini and Chileshe (2013))**

General challenging areas	References
• Provision and selection of appropriate tools, software, and devices • Communications • Cooperation/collaboration within members • Leadership style • Team development • Training • Building trust, team identity and team cohesiveness • Control and supervision • Member selection • Defining the location, the number and the relationship maps between all the offices and members	(Chinowsky and Rojas, 2003) (Chen and Messner, 2010) (Joseph, 2005) (Hosseini and Chileshe, 2013)

In essence, inherent idiosyncrasies of distributed teams such as geographical, temporal, organisational and cultural dispersions between members make them to be entities with unique challenges different from the ones of face-to-face teams (Chen and Messner, 2010). This has made exploring such challenges very relevant in view of the lack of studies on the topic as the driving force behind conducting the present study.

Research methods

Case study was chosen as the main method alongside a review of literature. The justification for selecting case study was due to the fact that offshore outsourcing is inherently a complex practice, restricted to a certain time period, locations and embedded in particular cultures. Thus, taking a holistic approach rather than a reducible approach for research becomes relevant as described by Verschuren (2003). Case study research findings provide insight into an issue through examining and observation of incidents, events and settings in a particular case by reflecting experiences. The definition for case study strategy in this paper conforms to the definition proposed by the authoritative work of Creswell (2003). As such, case study in this paper encompasses exploring one project confined by activity and time boundaries for collecting comprehensive information during a certain period of time. This entailed involvement with project team members within the natural context of the project to observe the challenges encountered for delivering the project. The first author was an employee in the project. This added great value to the information gathered in the present study as pointed out by Tribelsky and Sacks (2011). That is, researchers became able to overcome many issues facing researchers in terms of access to project documents, attending meetings and recording exchanges.

The context of the study

The case adopted for this research hereafter referred to as Project A was carried out in 2013 within the South Australian construction industry and entailed offshore automation consultancy. The client was a state government department and the principal contractor for automation of a government facility was one of the prominent local automation companies. After winning the project, the principal contractor closely cooperated with the client team and defined the scope of work. At the outset, the principal contractor's engineering team developed the basis of design that was afterwards approved by the client. To cut off the cost of engineering resources and to make South Australian engineering team more focused on other aspects of the work, the principal contractor decided to engage an offshore automation service.

An offshore consultant company (OCC) was assigned with the task of reviewing the basis of design, providing comments, finalising the design after discussion with the principal contractor's engineering team, developing codes based on the standards supplied by the client and submitting the codes by a nominated deadline to the principal contractor for review. Besides, OCC was supposed to revise the codes based on the collective comments from the client's representatives and the principal contractor's engineering team.

The principal contractor's engineering team accordingly maintained a close cooperation with the client's representatives to ensure that the product delivered by OCC is in accordance with the client's requirements. Prior to inception of this cooperation arrangement, a corporate risk analysis was undertaken to identify any major risks associated with this cooperative approach. To avoid or mitigate some major risks, a manager was appointed in OCC, who became in charge of regular communication with the principal contractor's engineering manager as illustrated in Figure 1.

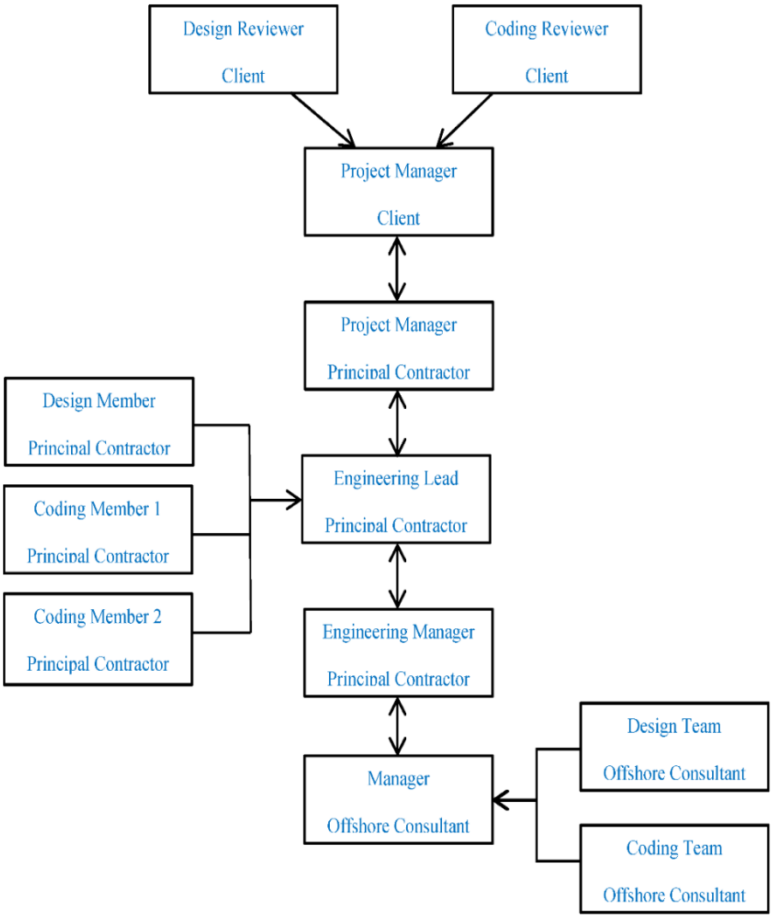

Fig. 1. **Project A communication chart**, *(Source: authors)*

To provide full access to the documents, drawings, photos and standards, all files were shared via a virtual service (i.e. Dropbox).

Challenges

Temporal distance

As the time zones of OCC and the principal contractor were different, some critical communications via phone, email, and videoconference were not efficiently made. For instance, a significant milestone was due to be completed by a Tuesday and OCC agreed to utilise extra resources over the weekend to ensure the timely completion. Crucial information was requested by the offshore team at 6 pm, South Australian time, four days prior to the completion date, after working hours of all key engineering team members. Even though the engineering manager of the principal contractor had received the notification, there was no qualified engineering resource in South Australia to support the offshore team. As a result, the milestone was delayed by two days. This specific incident delayed the project as the milestone was on the project critical path. The clear message of this observation was:

Temporal distance becomes a major barrier to distributed team working in large distances by reducing the potential for real-time problem solving. This challenge becomes highly detrimental

to effective team working in distributed teams when there is a glaring difference in terms of time zone among team members. This results was closely in alignment with observations made in construction teams by Nayak and Taylor (2009) in regards to distributed team working challenges with members located in large distances from each other such as in the UK and Australia. This also acknowledged the discussions of O'Leary and Cummings (2007, p.437) opining "…at distances larger than those triggering reductions in spontaneous synchronous communication, interaction decreases and, thus, reduces the potential for real-time problem solving…".

Delayed and ineffective Communications

Some technical issues were identified by the offshore team members, which required external input. Thus, the offshore manager had to communicate the issues to the South Australian team. Due to unavailability of the South Australian resources on specific occasions and time-consuming process of communication, resolution and receiving feedbacks, milestones were frequently delayed.

This was exacerbated by the fact that due to lack of rich communications, offshore engineers and programmers struggled to understand some requirements defined by the client. Whenever such an issue was raised by the offshore team, the resolution took a significant time due to both communication related causes and technical malfunctions. In some instances, to avoid any delay, the offshore team manager decided to direct the offshore team on his own assumptions. As a result, some products were not on specification due to the incorrect assumptions as a problem observed frequently in offshore outsourcing projects (Nayak and Taylor, 2009). The South Australian team had to spend further time and energy to rectify the faulty product. This is fathomable because maintaining low quality of communications in distributed teams has been discovered as a source of poor quality of products, low productivity and serious risks as asserted by Bovee et al. (2003).

It could be inferred that communications in distributed team working are time consuming and by far lower in terms of quality, richness and bi-directionality. Hence, such issues should be factored in for scheduling of work and defining milestones for distributed team arrangements. Otherwise, team members would resort to act on their assumptions to offset the effects of delayed communications.

Lack of full commitment and accountability

Lack of full commitment was also observed among a majority of the offshore engineers and programmers. Due to not having direct communications with South Australian counterparts, the sense of urgency; that was a key driver in South Australia, was not fully understood by the offshore staff members, thus no synergy was achieved over the lifecycle of Project A. This could be justified in terms of lack of accountability due to lack of direct and continuous communications with team members in South Australia alongside the absence of an effective supervision and performance evaluation policy as a problem in distributed teams identified by Hosseini et al. (2013). According to Ferris et al. (2008, p.229), "…accountability is critical to the success of organisations and the ability to establish its antecedents and outcomes should be of utmost importance…". In addition, as observed by Nayak and Taylor (2009) team members in distributed teams have different work-related perspectives as a major challenge to distributed

team working in the construction context. This explains the discrepancy in the level of priority assigned to tasks in OCC and in South Australia.

Due to different levels of priority put on one project for different organisations involved in distributed team working, level of commitments becomes different. This gets worth by the lack of direct supervision and performance evaluation in distributed arrangements. Therefore, lower levels of productivity and performance should be considered in designing distributed teams and scheduling of tasks.

Lack of an integrated resource allocation

Unavailability of resources at critical times is a contributor to an unsuccessful offshore service. In some occasions, a critical decision required some detailed technical information from the South Australian office and there was no qualified resource available to provide the OCC team with such information due to South Australian public holidays, annual leave or even non-working hours. As a result, the communication between the two teams became more time-consuming and accordingly delayed the project. As argued by Nayak and Taylor (2009), lack of an integrated resource allocation might end up in duplication of roles and responsibilities, which results in redundancy of human resources. This also points to the prominence of continuous monitoring of workloads of team members across all organisations as stated by Chinowsky and Rojas (2003).

An integrated resource allocation is necessary among different organisations involved in offshore outsourcing to prevent lack of resources. In essence, resource allocation in each organisation should factor in the requirements of other organisations and milestones.

Difference of working norms and codes

Certain working practices and norms become embedded in the work practices of particular locations due to the codes and regulations enforced in the location. This might end up in conflicts, reworks and dissatisfaction with products in offshore outsourcing projects (Nayak and Taylor, 2009). This was the case for Project A. That is, lack of familiarity with Australian standards; particularly, if an Australian client customises the standard, was a major challenge for the offshore services. In two different occasions, the OCC team of Project A refused to continue working on a specific product design as the client's in-house standard did not satisfy the international standard that was being followed by the OCC team. It ended up in a conflict because the offshore team believed that the client's standards are obsolete and do not meet international requirements. Such issues created relationship friction between the two different management teams. Hence, further time and energy was spent to increase level of agreement among the client, the principal contractor and the OCC.

To resolve the issues stemmed from difference in working practices and working regulation, a clear structured governance to clarify the objectives (Nayak and Taylor, 2009) alongside regular training and visits (Chinowsky and Rojas, 2003) should be considered.

Lack of face-to-face meetings

Evidence has demonstrated that despite advancement in technology, maintaining face-to-face meetings is indispensable to the success of distributed team working arrangements (Henderson,

2008; Wang et al., 2014). On Project A, the strategy of having one point of contact from each company was opted, however no team meeting was organised to introduce the design and coding members of both teams to each other. No team member in South Australia knew any OCC resources and there was no sense of teamwork among these resources. To South Australian engineering team, the product was created by "some" overseas resources, who may not know what the South Australians require. This was a source of frequent challenges, because as stated by Chinowsky and Rojas (2003, p.102) *"virtual teaming requires initial face-to-face meetings to develop a sense of "team"."*

Discussions

As per the discussions presented above, findings of previous studies on challenges facing distributed teams in the construction context were replicated in the present study. This comprised challenges due to temporal distance among team members (O'Leary and Cummings, 2007; Nayak and Taylor, 2009). Besides, problems with communications, lack of cohesion and commitment in teams and necessity of face-to-face meetings were acknowledged as previously identified by Chinowsky and Rojas (2003) and Nayak and Taylor (2009). Lack of commitment and accountability reconfirmed the arguments by Hosseini et al. (2013) indicating the crucial role of continuous supervision and performance control in distributed arrangements. Such replication of findings enhances the external validity of the challenges identified in the present study through providing a theoretical triangulation. Nevertheless, the present study contributes to the field by drawing attention to the crucial role of implementing an integrated system of resource allocation and scheduling. Such an integrated system should factor in a productivity level for distributed teams in lower levels in comparison to collocated arrangements.

Additionally, the study outlines below a number of guidelines to minimise the detrimental effects of the identified challenges as the practical contribution of the study.

- Senior management shall justify the aims and objectives of the relationship and set company's priorities in this relationship at the outset.
- A preliminary budget should be allocated to provide the infrastructure required for supporting the relationship. Level of such infrastructure to be determined by senior management.
- At least one or two trips to project location and the main management office should be organised to make sure that the key members of both parties meet each other in person and a minimum level of familiarity among the key members is achieved.
- Regular meetings should be arranged among the key technical members of both teams to avoid any misinterpretation of the requirements and to reach mutual understanding
- Occasional video conferencing meetings should be organised for all team members to increase the level of synergy.
- Availability of all key resources in critical times (e.g. project falling behind the schedule) should be secured through introducing an integrated system of resource allocation among all the parties involved.

Conclusion

With advancements in information and communication technology, distributed team working for harnessing the benefits of globally distributed resources and overcoming the challenges of

globalisations is receiving growing attention for companies active in the construction context. Such method of team working however is fraught with inherent challenges that should be considered prior to making any decision about adopting such an arrangement. The present study identified a number of challenges through observing one case of offshore outsourcing in South Australia. Considering the replication of the findings of previous studies, some guidelines were presented to facilitate tackling the challenges as identified. Beside, as the contribution of the study, the crucial role of implementing an integrated resource allocation and scheduling system for involved organisations came to light. It is noteworthy of mentioning that the findings should be considered in view of the limitation of the study. These include collecting data from one state in a developed economy (i.e. Australia), thus any generalisation of the findings to developing economies and context glaringly different in terms of socio-economic aspects should be treated with caution.

Nevertheless, the study opens the door for future research studies by providing a fertile ground for further investigation. As such, one ground for future inquiries should be investigating the strategies and operational aspects and exploring the best practices for establishing an effective integrated resource allocation and scheduling system among organisations in a distributed team arrangement.

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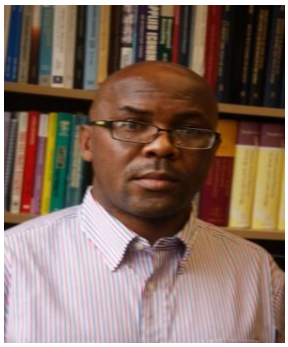

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