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EXPECTATIONS BETWEEN PARTIES PLAYING SIMILAR ROLES IN GLOBAL SOFTWARE DEVELOPMENT: A PSYCHOLOGICAL CONTRACT PERSPECTIVE

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Abstract

Global software development (GSD), as a mode of information systems development, surfaces various challenges and benefits that are not always present in co-located teams. A psychological contract reflects the written and unwritten expectations, or obligations, of collaborating parties in a transaction. This paper uncovers a set of candidate obligations that make up the psychological contract of parties collaborating in global software development efforts (the GSD psychological contract). Particular focus is applied to certain development roles: business analyst, designer, developer and development-support. A qualitative research approach is employed against various incidents that occurred in development projects performed by a global software product development organization. Finally, opportunities for future research are presented.

Keywords: Global Software Development, Distributed Development, Psychological Contract

1 INTRODUCTION

Globally distributed information system (IS) and software development (GSD) is a phenomenon that emerged in the 1990's. This approach to development involves the production of systems using a distributed set of staff. There are many configurations of GSD teams and examples range from remote sub-teams producing specific modules of a system to teams where different functional roles such as programming and business analysis are executed in different locations.

Teams that conduct GSD may gain certain advantages over those that are co-located. Conversely, distributed teams may encounter obstacles that are not major issues in co-located teams. In a review of the published peer-reviewed literature on GSD, Ågerfalk *et al* (2005) proposed a framework of the benefits and challenges related to this field. Their work and much of the literature that it summarized, primarily used the GSD team as the unit of analysis. Given the importance of peer-to-peer interaction in GSD projects, this research used the framework to explore collaboration between individuals that had played the same development role. In addition to being a novel feature of this study, it also helped to focus the investigation and helped facilitate in-depth analysis of a complex phenomenon. The needs of each party were investigated to uncover the reasons why characteristics of GSD supported the successful resolution of certain needs and obstructed the achievement of others. A set of obligations was induced from each role-specific situation explored and a general set was proposed based upon patterns discovered across the different situations.

Four particular roles were selected for investigation: development-support, designer, developer and business analyst. These roles were selected primarily due to their central influence on IS development. Clearly, other roles could be reviewed in future research efforts. All GSD situations explored involved a team within a product development organization. The need for proximity to global markets and access to diverse global experiences makes GSD attractive to the producers of commercial off-the-shelf (COTS) products. Hence, concentration on one type of team narrowed the research parameters to teams whose needs are aligned with the assumed benefits of GSD and thus clearly identified a target audience for the study findings.

In order to frame the study theoretically, Psychological Contract Theory (PCT) was adopted. In his treatment of the evolution of PCT, Roehling (1997) outlined how it has been generalized to describe many different interdependent relationships. PCT considers the interpretation of written and unwritten aspects of a contractual relationship, and particularly emphasizes the importance of the latter. A psychological contract (PC) represents the expectations of two parties about the mutual obligations that each has towards the other in order to make the relationship successful. In a recent article, Koh *et al* (2004) used PCT to understand the unwritten agreements between counterparts in IT outsourcing relationships. As stated earlier, our study needed to uncover unwritten expectations between remote parties in IT projects. The similarity of these research requirements motivated serious consideration of the theory and its subsequent selection as a framework for eliciting the needs of remote counterparts. PCT emerged in the 1960s and has been the focus of a lot of academic interest since its use by Denise Rousseau in the early 1990's (Roehling 1997). It has also featured in several IS research studies (e.g. Piccoli and Ives, 2003; Koh *et al* 2004). In their research into supplier/customer relationships in IT outsourcing engagements, Koh *et al* (2004) used PCT to induce a set of 12 obligations. Since GSD share many similarities with IT outsourcing arrangements, these 12 obligations were used as input to this study, serving as candidate obligations to be explored further. However, given the different research contexts, there was an expectation that the GSD PC would reflect a refinement of these 12 as well as possibly include additional obligations.

The paper proceeds as follows. First, a review of the above three core areas (roles, GSD teams and PCT) is presented followed by a discussion of the research design. Second, the analysis of the research findings including a basic set of mutual obligations to be used in general GSD collaborations (the GSD PC) is presented. Finally, the relevance of this study to both industry and the research community is outlined followed by a presentation of future research opportunities.

2 THEORETICAL BACKGROUND

2.1 Information systems development roles studied

IS development teams exhibit skills such as strong technical competence, programming, quality assurance, management and good domain knowledge (Carmel and Sawyer 1998). All team members do not have to display these skills equally – the extent to which each skill is relied upon depends upon the role being played. Software development roles are defined to execute various activities of the software lifecycle and the process in use governs these activities. As part of the software lifecycle, the requirements engineering process involves the elicitation, analysis, specification and validation of requirements (Sommerville 2006). Many different roles may be involved in this process. It is possible that a slight confusion may exist in the area of role definition due to different organizations applying different role titles to actors performing similar activities (e.g analyst, systems analyst, requirements engineer, business analyst.). For the purpose of this study, single role titles were attributed to different activity sets, briefly described in the following.

Initial high-level requirements are generated and validated by a *Product Manager* working with marketing data and customers (Stevens *et al* 1998). A *Business Analyst* performs the activities required to expand high-level needs into detailed requirements. Different requirements engineering situations may influence the elicitation techniques used or the type of software specifications produced. (Lauesen 2002; Power and Moynihan 2003). The specifications provided by the business analyst are used in the design process to produce a logical design that guides code development. Detailed design involves the specification of the software to be developed. Its primary motive is to direct code development. Many notations and design methods are available to develop and communicate designs. A designer will need to be proficient in the tools and techniques used by his/her team. (Wasserman 1996) Design is quite often a collaborative activity and as such is exposed to many of the issues around group interaction. These are further exacerbated in a GSD environment (Pfleeger and Atlee 2005). A *Developer* is responsible for the implementation of the design by production of code using some pre-defined programming language. The role of *Development-support* is responsible for the support of tools such as configuration management (CM) systems and computer aided software engineering (CASE) systems.

2.2 Global software development

Carmel (1999) wrote, “A *Global Software Team is separated by a national boundary while actively collaborating on a common software/systems project*”. Ågerfalk *et al* (2005) define global software development (GSD) as the execution of any software lifecycle activity (including maintenance) by a group of people who are geographically dispersed. Essentially, GSD is the collaborative production of software across sites.

There are various motivations that have prompted the growth of GSD. These include the need to reduce costs, gain proximity to customers, exhibit a global image, reduce development project timelines and leverage specialized skill sets. These motivations are further supported by various improvements introduced by GSD teams. These include the encouragement of disciplined process to manage distance issues and the promotion of innovation caused by the diversity of team member’s backgrounds (Carmel 1999).

Another approach to the exploration of issues and benefits of GSD was provided by Carmel's (1999) treatment of the "centrifugal" and "centripetal" forces that influence this form of development. He lists distance, cultural differences, loss of "teamness" and impacts to communication, coordination and control mechanisms as issues that favour collocated development over GSD (Carmel 1999). Complexities to design introduced by distance are further detailed by Rafii (1995), while further reference to the reduction in coordination and control is provided by DeSouza's (2001) views on "opportunistic interactions". He also highlights the coordination issue of expertise identification and selection. This issue is prevalent in a review of coordination issues within different distribution configurations, (Grinter *et al* 1999). Another issue reported by Grinter *et al* (1999) was mistrust between team members due to lack of informal communication and this point supports the potential impact to "teamness" imposed by GSD. Carmel (1999) proposed a number of centripetal forces, or solutions, that help make GSD work. These included a strong telecommunication infrastructure, use of collaborative technologies and software development methodology. Certain team configurations may also support GSD depending upon the organization's resources and type of product being developed. These include modular structures, phase-based structures; functional expertise-based structures; customization-based structures and team configurations that are time-zone based in order to transfer work through the 24-hour day ("follow the sun"). Managerial techniques to tackle trust and team cohesion issues may be employed to help foster effective GSD. Techniques such as lateral communication may help push decision making to the parties with most information on a subject (Galbraith 1977).

In an attempt to synthesize the published peer-reviewed literature, Ågerfalk *et al* (2005) developed a framework listing benefits and issues related to GSD (see Table 1). As can be seen from the table, they focused on communication, coordination and control processes from the perspectives of geographical, temporal and socio-cultural influences. This framework was used in this study to drive data collection and analysis activities, as discussed below.

	Temporal Distance	Geographical Distance	Socio-Cultural Distance
Comm.	+ Improved record of communications - Reduced opportunities for synchronous communication	+ Closer proximity to market + Access to remote skilled workforces - Face to face meetings difficult	+ Innovation and sharing best practice - Cultural misunderstandings
Coord.	+ Coordination needs can be minimised - Typically increased coordination costs	+ More flexible coordination planning - Reduced informal contact can lead to lack of critical task awareness	+ Greater learning and richer skill set - Inconsistent work practices can impinge on effective coordination - Misunderstandings
Control	+ Time zone effectiveness can be utilised for gaining efficient 24x7 working - Management of project artefacts may be subject to delays	+ Communication channels can leave an audit trail - Difficult to convey vision and strategy - Perceived threat from training low-cost "rivals"	+ Proactiveness inherent in certain cultures - Different perceptions of authority can undermine morale - Managers must adapt to local regulations

Table 1: Overview of the Framework for GSD issues (after Ågerfalk *et al* 2005)

2.3 Psychological contract theory (PCT)

The term "Psychological Work Contract" was proposed by Argyris (1960) and used to reason about the dynamics of the relationship between a foreman and his/her supervisees in a business setting. It proposed that an unwritten agreement existed between the parties. A point to note on this treatment

was that the contract dealt with a *shared* agreement between a group and their supervisor. Levinson *et al* (1962) extended PCT in their proposition that many *individual* agreements existed in an organization and that these agreements consisted of two sets of implicit beliefs representing the expectations of the employee and the company. These expectations were further qualified as demands – there was a perception by one party that the other party was obliged to fulfil them. Another aspect of their findings was the existence of an element of mutuality: each party agreed to the expectations of their counterpart (employee–company). Kotter (1973) tightened the construct by having each party produce expectations of both themselves and their counterparts. These expectations were then correlated for matched giving-receiving expectations. Use of the PC construct is not limited to the relationship between employer and employee. It has been used on a variety of other relationships to represent the unwritten agreements between parties. Examples of relationships include customer/supplier and landlord/tenant (Roehling 1997). Rousseau (1995) restricted the use of the psychological contract to the internal beliefs of the individual. In order to assist future research in the subject, Rousseau (2001) examined the psychological contract structure by looking at its components: schema, promise and mutuality. She stated that a PC:

- Is a schema or mental model formed from external messages and social cues of the organization and also from an individual’s internal predispositions.
- Arises from a person’s understanding of their personal commitments and their perception of the obligations of their counterpart in an agreement.

Although Rousseau stressed the importance of mutual obligations, she defined these to be the *beliefs* of an individual that the obligations are mutual. Emphasis on the individual’s “beliefs” of mutuality permitted Rousseau to focus on just the individual side of the agreement.

Koh *et al* (2004) used Rousseau’s interpretation of PCT to review the relationships between customers and suppliers in IT outsourcing projects. Their study focussed on the generation of a psychological contract using a grounded approach to uncover the mutually accepted set of obligations that existed between customers and suppliers. A key aspect of their research stressed the concept of mutuality in a PC. They investigated both parties of the relationship in order to induce the mutual obligations present in the situations. Their research design required that interviews were conducted with both the customer and supplier project manager for each IT outsourcing project in the study. The use of individuals to represent organizations in this two-sided approach represents a departure from Rousseau’s approach and is more consistent with Guest’s (1998) critique of her views. Each interview was designed to elicit the interviewee’s beliefs of both their own obligations and those of their counterpart’s. Findings were then compared to identify similar expectations highlighted by the collaborating parties. The matched expectations formed the list of mutual obligations that described the psychological contract. This research tactic also deviated slightly from Rousseau and is more aligned with Kotter (1973). Table 2 outlines the PC generated by Koh *et al* (2004).

Supplier Obligations	Customer Obligations
Accurate Project Scoping	Clear Specifications
Clear Authority Structures	Prompt Payment
Taking Charge	Close Project Monitoring
Effective Human Capital Management	Dedicated Project Staffing
Effective knowledge transfer	Knowledge sharing
Building effective inter-organizational teams	Project ownership

Table 2: *Psychological contract generated by Koh et al (2004)*

This obligation set formed part of the initial reference structure used to investigate the PC between individuals playing the same role in GSD collaborations (the GSD PC).

3 RESEARCH DESIGN

To support the need for data induction, a qualitative research approach was adopted. Preparation of the study resulted in the development of a conceptual framework (Figure 1). This defined the type of data to be gathered, focused the analysis, and promoted consistency across cases. This structured process helped to guide activities and avoid data overload (Miles and Huberman 1994). It describes the different roles that were studied and presents aspects of the different frameworks used to guide the research. Processes and dimensions of the GSD issues framework produced the challenges and benefits that may influence a PC between the roles. This PC may or may not consist of obligations from the set discovered by Koh *et al* (2004). Note that the conceptual framework was not developed as a foundation for formulating hypothesis to be tested. Rather it was used as a guide for data collection and analysis, as suggested by Patton (1990), and thus provided a set of seed categories (Miles and Huberman 1994) for an interpretive study (Klein and Myers, 1999).

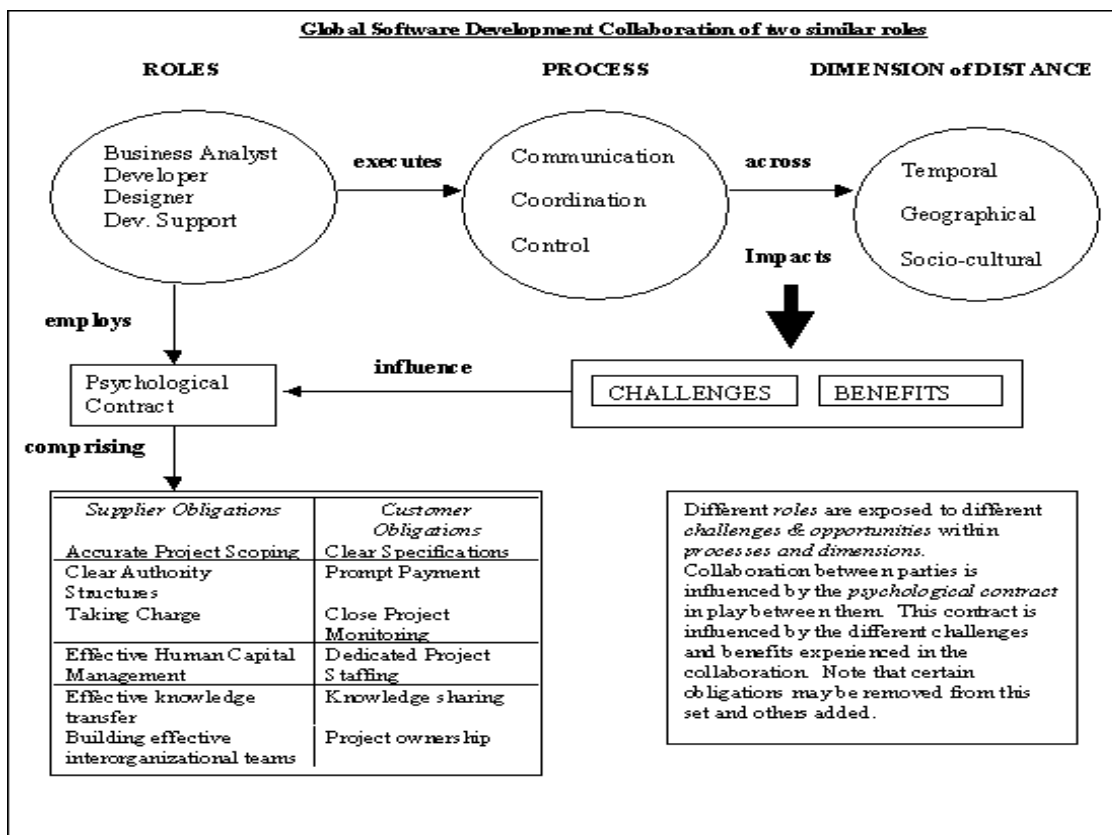


Figure 1: Conceptual framework of this study.

Individuals that had acted in the selected roles on GSD projects were identified from one particular global software product development organization. This organization had offices in over twenty five countries including specific research and development groups in five different continents. Each of the identified candidates supplied cases of projects where their participation required them to collaborate with a remote counterpart. In each case, both parties were acting in the same role and it was one of the four roles selected for the study. A motivation for this approach to case selection was that the first author had worked in the organization which greatly facilitated access. Views presented by Rousseau (1995; 2001) were used to guide particular decisions related to the study design. Obligations were induced by inquiring about different aspects of the collaboration. This inquiry concentrated on the

experiences of one side of the collaboration situation and explored the beliefs of that side about the mutual obligations of both parties. The study design allowed for the construction of individual PCs from each of the cases analysed. All results were then merged to define the shared mental model or normative agreement that would make up a GSD PC. Rousseau's views on contract stability, effectiveness of promises and impacts to mutuality influenced the selection of interviewees.

The critical incident technique of Flanagan (1954) was used to help guide research questions and promote interpretive consideration of experiences by the interviewee. The key to this technique is that an interviewee can clearly identify the objective of an incident and understand its impact. This allows them to form an opinion of the workings of an organization based upon their interpretation of the consequences of the incident (Gundry and Rousseau 1994).

The main method of data collection was the focused face-to-face interview. Merton and Kendall (1946) described the focused interview to be a suitable mechanism for the provocation of "unanticipated responses" which can lead to new and unexpected insights. As indicated above, the framework of GSD issues (Table 1) was used as a basis for deriving an interview guide (Patton 1990). Data analysis was then achieved by reducing the data using categorization techniques, presenting the data in clear manageable formats and the creation and verification of various conclusions. Each case contributed to an evolving set of cross-case conclusions. Following the completion of all cases, a final review of all cross-case findings resulted in the production of an overall report. Patterns of interviewee expectations were identified and these facilitated the emergence of a psychological contract. The case study protocol and database may be obtained from the first author upon request.

Figure 2 presents a more detailed view of the research flow. This format is adapted from Yin's (1994) case study design approach. It illustrates the application of the research across multiple cases in order to induce the overall PC emerging from these activities.

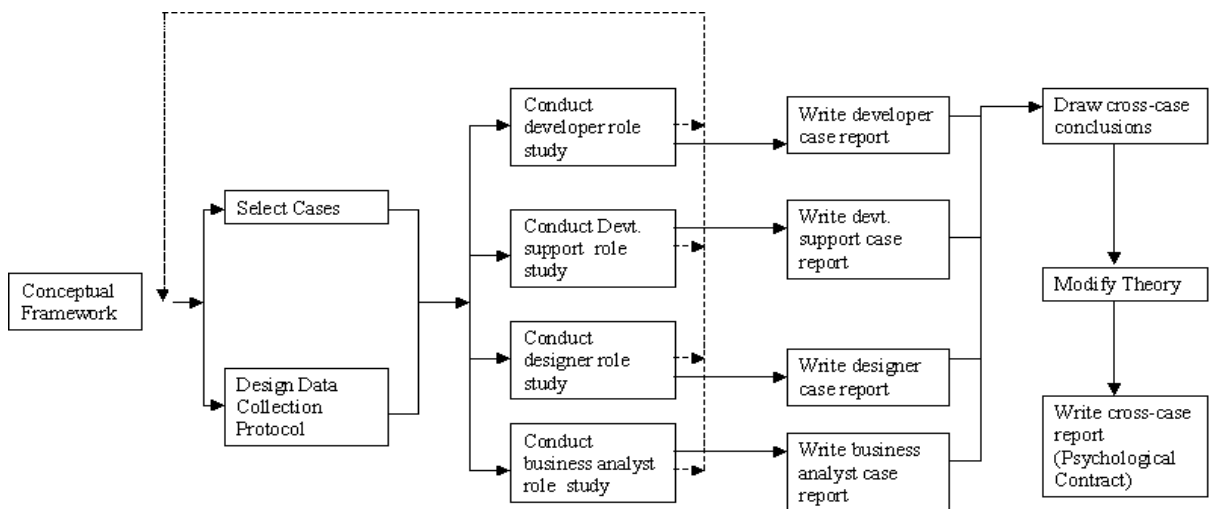


Figure 2: Tailored case study method (after Yin 1994)

The research design approach adopted in this study was primarily influenced by the recommendations of Miles and Huberman (1994) and Yin (1994). An iterative approach was followed and this allowed insights from one case to influence the research conducted in a subsequent case. Yin (1994) discussed the creation of a case study protocol and a case study database as mechanisms for introducing operational steps and traceability to the study. The case study protocol reduced a lot of the effort in phase implementations – this was especially important for data analysis, as there were many steps and forms to be completed. Miles and Huberman (1994) recommend prior instrumentation as a mechanism to assist internal validity by assuring that “a comparably measured response” is being obtained across informants. Usage of the initial conceptual framework to direct a clearly defined interview format helped to control these investigations and could possibly also be applied to future research.

4 RESEARCH FINDINGS

As summarized in Table 3, a number of expectations were identified in the analysis of the cases. Based upon patterns of obligations that emerged across cases, six major obligations were identified. Additionally, four minor obligations appeared in only one case each. Some of these obligations evolved from obligations that had been proposed as part of the IT Outsourcing study by Koh *et al* (2004). Others emerged from patterns discovered across the cases. Altogether these obligations constitute the GSD PC identified in this study, where the major obligations are probably the most likely to be applicable also in other GSD settings.

4.1 Findings related to the IT outsourcing PC

The initial set of obligations of the IT Outsourcing PC produced by Koh *et al* (2004) contained six obligations attributed to customers and six obligations attributed to suppliers (see Table 2). The analysis indicated that three of these obligations were suitable candidates for inclusion in the GSD PC.

Two IT Outsourcing PC obligations describe aspects of task management, coordination and responsibility. These are the customer obligation of “Project ownership” and supplier obligation of “Taking charge”. All cases exhibited evidence of an expectation of leadership, management and decisiveness. However, the IT Outsourcing obligations appeared to place a lot of emphasis on monitoring, decision-making and authority structures. The defensive orientation of these obligations may have arisen from the fact that the collaborating parties were participating in a customer/supplier relationship. The GSD study reported a more positive view – an expectation that if no formal authority structure existed, then the counterparts would endeavour to informally determine a leader. The two IT Outsourcing PC obligations were thus replaced by an obligation entitled “Providing clear leadership”.

An IT Outsourcing supplier obligation related to relationships and team building was defined as “Building effective inter-organizational teams”. Evidence of this obligation was found in all GSD cases studied, but there was an interesting distinction in its interpretation across the different cases. Business Analyst and Designer cases revealed the expectation that it was the responsibility of the collaborating parties to build the relationship. Developer and Development-support roles expected that their company should promote the process of establishing relationships between remote counterparts. They felt that their company should provide enabling structures and that all collaborating parties should use these structures. Due to the above distinction, the GSD PC includes two major obligations to cover this subject: “Building relationships” (responsibility of collaborating parties) and “Building effective inter-organizational teams” (responsibility of company). “Building relationships” required the collaborating parties to invest time in understanding their counterpart’s work practices and views. In the business analyst case, emphasis was placed on the need for each party to build trust as it was critical to successful resolution of tasks. Another aspect of these obligations was the expectation that parties would respond positively and proactively to structures created by the organization for the purpose of promoting a sense of “teamness” between distributed colleagues.

Two additional obligations were identified based on the IT Outsourcing PC. Since these only featured in one case each, they were both considered minor candidates for inclusion in the GSD PC (i.e. minor obligations). The developer case highlighted the expectation that clear requirements should be provided in relation to tasks to be performed. Both counterparts had a mutual need for a high-level view of the design approach related to the requested code updates. This corresponds to the IT Outsourcing customer obligation for clear specifications. The designer case described an expectation of good knowledge transfer between counterparts. It was felt that having knowledge of a counterpart’s skills would enable both collaborating parties to identify opportunities to educate one another and increase the team knowledge. The IT Outsourcing customer obligation of “Knowledge sharing” refers to the provision of education and skills needed by the supplier in order to assist them in their work. This description appears to match the expectation of knowledge transfer evident in the designer case.

4.2 New findings emerging from the data

Three new major obligations emerged from analysis of the different cases. These related to effective task handover, employee empowerment and awareness of cultural differences.

All cases showed a clear expectation that there would be a good handover of tasks between the collaborating parties. This was required in order to overcome obstacles to communication posed by distance. Entitled “Performing effective task handovers”, this referred to an obligation of both parties to protect their communication against potential misunderstandings. Activities described in the business analyst case provided details related to this expectation:

- Each party made themselves available for a set period dedicated to synchronous communication.
- Each party formatted asynchronous communication clearly in order to avoid misunderstandings.
- Each party requested clarifications when doubts existed about the communication.

Confirmation of the perceived mutuality of this expectation was highlighted in the designer case when reference was made to situations where counterparts failed to protect their communications. These situations were described as times when remote counterparts failed to meet their expectations. A positive outcome of this expectation was that it led to increased discipline in the recording of processes and designs, resulting in the generation of very effective and useful documentation.

“Being empowered to do one’s job” referred to an expectation reported in all cases related to independence and the ability to tackle a task in its entirety. An expectation was declared that each of the parties in a collaboration that is obstructed by a GSD issue should endeavour to ensure that the issue is not allowed to block future development. Examples of such obstructions included manual errors in the creation of environments to be used by collaborating parties in another time-zone. An expectation existed that each party would have the inclination and resources to avoid a repetition of these types of errors. Avoidance may have required a preventive measure to be implemented within a process or the provision (or receipt) of education on some aspect of the development.

Another reported expectation was related to sensitivity towards the culture of remote counterparts. “Being culturally aware” emerged in the business analyst and designer cases as situations were described where cultural sensitivity should be taken into account in job performance. For example, consideration of a counterpart’s holiday schedules could lead to more effective task planning. Belief in the mutuality of this obligation was emphasized by an example of arguably inappropriate behaviour involving a colleague’s ridicule of their counterpart’s use of the English language.

In addition to these major obligations, the business analyst case introduced two further minor obligations. First, there was a belief that business analysts need to be risk-aware in planning tasks. In order to deal with the potential impact to development caused by failure or suspension of an analysis topic, there was a need for secondary or contingency tasks to be planned to mitigate these risks. A second expectation reported was the belief that business analysts be technologically competent and ready to learn and use groupware tools that may assist them in their job. The absence of sufficiently advanced groupware tools was reported as a serious obstacle to distributed analysis activities. This case described various attempts to customize different tools to help facilitate the intense and rich communication needs that were sometimes required. These attempts demanded that all parties be willing to embrace new technology and consistently strive for more effective communication.

5 CONCLUSIONS AND FUTURE RESEARCH OPPORTUNITIES

This study set out to generate a psychological contract (PC) that contained the set of mutual obligations present between two remote counterparts playing the same role in a GSD collaboration situation (the GSD PC). To this end, a qualitative multiple-case study approach was adopted. Mutual expectations that were deemed to be present in multiple cases formed the major obligations of the

	Obligation	Meaning	Illustrative interview quote
Major Obligations	Providing clear leadership	Single point of coordination and decision-making. If not organized by formal company structures, then counterparts define mechanisms to ensure effective productivity in collaboration	“I do think the role of project manager or owner or leader or a responsible body who has the authority to say no is critical ... as you support multiple projects, everyone’s issue is their top-priority and they try to make it yours.” (Development Support)
	Building effective inter-organizational teams	Company invest time and effort to foster a good working relationship among the team working on the project	“I don’t think the communication part ever worked – there was no investment... It was the opposite to the process used now to open new offices where things are put in place to make everybody work well together.” (Developer)
	Building relationships	Invest time and effort with counterpart to understand their work style and preferences. Build level of trust with counterpart. Be open to company’s teambuilding activities.	“we had to trust one another. Yes, we tested our trust of one another due to this informal relationship – this was very crucial to our job” (Business Analyst)
	Performing effective task handovers	Awareness of potential misunderstandings. Pre-empt possible questions that may lead to task suspension and delays. Where necessary, provide appropriate documentation. Be available for synchronous communication. Where necessary, request clarifications.	“At the end of your day you needed to try and avoid the potential problem the following morning. So I felt I had an obligation to try and prevent this issue.” (Designer)
	Being empowered to do job	Allow parties to coordinate and prioritize (where appropriate), their activities to suit the needs of the situation and themselves. Provide documentation and education required to do the job – do not permit remote interdependencies to be a constant obstacle.	“The fact that there was an 8 hour time difference, ... to wait hours for the expert who could give the answer off the top of their head was a huge drawback. If you were focused on a show-stopper this could waste a lot of time ...” (Developer)
	Being culturally aware	Sensitive to background, experiences and culture of remote counterpart	“Because English was not their native language, I spoke more slowly and clarified issues” (Designer)
Minor Obligations	Having clear specifications	Understand and articulate explicitly and comprehensively the requirements for the services covered by the outsourcing project	“The hardest part of job was to actually get a clear picture of application flow. A lot of detail was not presented up-front.” (Developer)
	Conducting knowledge sharing	Provide information required by supplier, and to educate supplier with the industry- and firm-specific knowledge necessary to build or operate the system.	“..it would be better overall for the team if everybody felt it was better to provide extra help for folks... they should have an awareness of skill sets and where to fill in deficiencies of skills ...” (Designer)
	Being risk-aware	Be risk-aware in planning all tasks	“I tend to do a lot of risk analysis... a lot of what control is about is trying to pre-empt what could happen.” (Business Analyst)
	Being technologically competent	Ready to learn and use groupware tools that may assist in the job.	“I would love if we had tools to enable us to make better use of one another’s artefacts... it would require both parties to be on the exact same plane”(Business Analyst)

Table 3: *The GSD psychological contract identified in this study.*

resultant PC presented in Table 3. In addition, a number of single case findings constitute a set of minor obligations of the GSD PC. In industrial contexts, the GSD PC generated from this research could form the motivation for a number of initiatives to promote the effectiveness of remote collaborations. Although it may appear obvious that companies engaged in GSD should address issues such as cultural differences, the findings of this study could help direct such initiatives. Leadership training programs and workshops could empower employees to influence expectations such as “clear leadership”, “building relationships” and “being culturally aware”. Technical training programs could be put in place to ensure employees are capable of managing the changing needs of their roles. Project schedules could be supplemented with activities that build effective inter-organizational teams. From the perspective of the minor obligations, training programs could be instituted to ensure technological competence, knowledge sharing and risk-awareness. Also, standards could be put in place to support high-quality task specification.

The findings from this study and the supporting data provide novel contributions to the general body of GSD research. A notable distinction of this research into the field of GSD is its focus on specific roles. Findings may be used for further exploration of role-specific GSD issues or to verify existing research positions. The study of *same-role* collaborations narrowed the research scope even further. Data gathered in this study could be useful in research efforts to explore role characteristics present in same-role collaborations and supplementary research could explore the characteristics of a role participating in cross-role collaborations. To the best of the authors’ knowledge, this is the first research effort related to PC generation for parties playing the same role in GSD collaborations.

There are clearly a number of potential extensions to this research effort. These activities could leverage the case study protocol and database created in this research program. The research findings could be extended and further validated if more cases from different organizations were incorporated into the study (Yin 1994). Certain minor obligations may be elevated to major status if they were found to be of importance in other cases. Future research could also widen the set of cases to incorporate additional roles and cross-role collaborations. Certain limitations evident in the validity of this research could be addressed by future research studies. This study limited its investigation to cases involving one particular organization. It is possible that certain mutual expectations may not have been evident in that organization for a variety of reasons. In their study of IT outsourcing engagement, the PC generated by Koh *et al* (2004) was validated by a subsequent quantitative assessment of the success of outsourcing engagements when the contract is fulfilled. Over 150 companies engaged in outsourcing were surveyed. The survey investigated the participant’s perception of the level of fulfilment of the psychological contract’s obligations and also the success of the engagement. due to organizational culture. A similar approach could be taken with the GSD PC in order to determine its validity in successful GSD projects. Sets of collaborations could be identified that represent the behaviour of teams in particular project situations. This would facilitate alignment of the research to certain projects. In line with Koh *et al* (2004), a quantitative survey could also be carried out to test the influence of the GSD PC on successful software development projects.

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