Knowledge Sharing Challenges in Subsidiary-to-Subsidiary IT Infrastructure Outsourcing: A Case Study on a Financial Services Provider

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ABSTRACT

While prior studies have focused on information technology (IT) outsourcing challenges in general, those studies have not adequately addressed knowledge sharing challenges facing subsidiary-to-subsidiary IT infrastructure outsourcing relationships. This qualitative case study explores the major knowledge sharing challenges experienced in a subsidiary-to-subsidiary IT infrastructure outsourcing relationship at a large South African financial services provider. Using the knowledge-sharing success model, thematic analysis of semi structured interview data from twenty-one IT staff representing both the consumer and the IT services provider reveals three main interrelated knowledge-sharing challenges areas: service delivery quality, information sharing, and communication. The study extends upon the existing knowledge-sharing success model by including the role of management support in managing knowledge sharing challenges effectively. Future research should investigate the impact of service delivery quality, information sharing, and communication challenges in other types of IT outsourcing relationships.

1 Introduction

Information technology (IT) infrastructure outsourcing has grown significantly in the past ten years across all industries ranging from the financial services, pharmaceutical, manufacturing and the government sector [14]. According to a report from Statista [27], IT infrastructure outsourcing equates to over 40% of all IT outsourcing globally. This makes infrastructure outsourcing the third most outsourced IT function after software application maintenance and software application development. IT outsourcing allows organizations to delegate the transfer of a service or hardware to a third-party service provider, consequently delegating the responsibility and risk of the service delivery to the service provider [20]. Therefore, the service provider needs to ensure accurate risk management and continuity of the service delivery.

Chang, et al. [3] argues that IT outsourcing gives an organization the freedom to focus on their core business functions and allows IT specialists to handle their IT needs. In addition, some of the reasons organizations and institutions outsource their IT needs is because it lowers both investment and operating costs, offers scalability, and affords the business access to exceptional talent and access to the latest technology [23, 29]. However, Benaroch [6] advises that core functions of an organization should not be outsourced as they might place the organization in a vulnerable situation. Core functions refer to primary functions that provide an organization with a competitive strategic advantage. Organizations cannot easily enhance core functions by large investments, relying instead on the collective learning that takes place within the organization [19].

Researchers have found that organizations are selective about their IT outsourcing approach [18, 26]. Organizations may select from among different IT outsourcing arrangements, from offshoring, business

process outsourcing (BPO), application service providers (ASPs), multisourcing, backsourcing, to crowdsourcing. Organizations can also select from insourcing (which occurs when IT services are bought and provided inside the organization) and concurrent IT sourcing (which features combinations of insourcing and outsourcing of the same IT activities). IT infrastructure as defined by Varajão, et al. [4], is a collection of information technology components that serve as the basis of the operation of any IT service. IT infrastructure mostly consists of physical components such as servers, network switches, and storage devices, although it also includes various software applications and other networking components to operate and meet the needs of an organization. According to Varajão, et al [4], some of the risks and concerns that accompanies IT infrastructure outsourcing includes: ensuring business continuity, protecting sensitive information, and limiting the organization's innovation capacity. Effective knowledge sharing can help organizations mitigate some of these risks and overcome many challenges faced in IT outsourcing [1].

According to Lee [1], knowledge sharing is a critical success factor in successful IT outsourcing partnerships. Following Lee [1], IT infrastructure outsourcing is viewed here as a partnership that is dependent on implicit and explicit knowledge sharing. However, knowledge sharing between people from different organizations poses a formidable challenge to managers [1]. The purpose of this research study is to explore major knowledge sharing challenges that parties experience in a subsidiary-to-subsidiary (S-2-S) IT Infrastructure outsourcing relationship.

2 Literature Review

Organizations can outsource IT services for the support functions of their business such as payroll, IT infrastructure, transaction processing, and call centers, just to name a few [2]. One of the potential benefits of IT outsourcing is that it enables the organization to focus on building their brand, providing a higher value-added service, and focusing on research and development. This can subsequently increase the productivity and efficiency of the organization, as IT outsourcing vendors are able to provide a more advanced IT capability [6]. In addition, IT outsourcing provides organizations with access to skilled, qualified and certified IT specialists. Chang, et al. [3] argue that instead of capitalizing on an individual's knowledge and expertise, IT service providers should make a team of trained and qualified specialists to develop and maintain IT services. This allows the organization to avoid recruitment costs and hiring new IT specialists [22].

IT outsourcing allows organizations to leverage on the service provider's buying power and supplier relationship for cost effectiveness that allows the organization to avoid investing a lot of money acquiring costly IT hardware, software, licensing, and IT specialists [11]. Outsourced clients can get the latest technology when they need to upgrade or scale up their IT services. When IT services are hosted and maintained by the service provider, organizations get to save on operating costs as IT infrastructure upgrades, patching, skills training and general maintenance becomes the service provider's responsibility [10]. Furthermore, IT outsourcing offers reduced IT risks. Given the advanced collective expertise and knowledge of the service provider, risks around compliance, data breaches, business continuity and disaster recovery becomes the responsibility of the service provider [5]. Reputable IT service providers that work closely with other specialized third parties to keep their datacenters up to date with regulations and technology are able to reduce the risks associated with non-compliance, security breaches and IT services downtime [16].

However, Almutairi [5] argues that the increased dependency on technology and the need for organizations to outsource their IT needs is also accompanied by critical challenges and concerns. Some of these challenges are technical, such as migration procedures, technical operations, and data security, while other challenges can be people-related, such as conflict and communication [24]. This research study will focus on these

relational issues and in particular, the knowledge sharing challenges experienced in a subsidiary-to-subsidiary (S-2-S) IT infrastructure outsourcing relationship. Knowledge sharing plays a key role in how organizations and individuals learn from their partners [1].

Table 1: Knowledge-sharing success framework (Lee, 2001).

Concept	Definition
Implicit knowledge sharing	Forms of knowledge that can be expressed in verbal, symbolic or written form, but is not yet expressed in these forms.
Explicit knowledge sharing	Forms of knowledge that exists in symbolic or written form.
Partnership quality	The service receiver and provider have a clear and common vision and goals for the partnership.

This study will use Lee's [1] knowledge-sharing success model as a sensitizing model to explore how individuals relate in an IT infrastructure services subsidiary-to-subsidiary outsourcing relationship. A knowledge-based approach accounts for how knowledge sharing occurs between individuals in subsidiaries. Participants in IT outsourcing have different backgrounds and duties in the outsourcing relationship and will have different understanding of the IT outsourcing challenges experienced in the relationship. Nonaka and Takeuchi [24] argue that these differences make knowledge transfer between organizations a formidable challenge. Lee's [1] concept of implicit and explicit knowledge sharing and partnership quality in outsourcing relationships will form the basis of the sensitizing model used to analyze the case study data.

3 Research Site and Methodology

A single in-depth case study approach is appropriate to explore the knowledge sharing challenges experienced in a S-2-S IT infrastructure outsourcing relationship [7].

3.1 Case study site

This study focuses on two subsidiaries, the corporate and investment banking subsidiary (consumer X) and the retail and commercial banking service provider X (a pseudonym – as are all names used in this paper). Prior to the year 2016, each subsidiary had its own datacenter, which they had full control over. In 2016, the group made a strategic decision to consolidate all its subsidiaries' computing resources into one centralized datacenter. The parent group (referred as Group X in this research) decided that instead of outsourcing IT infrastructure to an external partner they would use one of their existing datacenters. Group X decided to combine the datacenter of the retail and commercial banking subsidiary into a group-wide IT infrastructure provider. This type of outsourcing is an insourcing relationship from the group's point of view and an outsourcing relationship from the subsidiary's point of view. The consumer's IT infrastructure was migrated, and its IT specialists were transferred to the service provider's datacenter. When consumer X needs a certain configuration or modification to the IT infrastructure, they log a service desk call with service provider X. Consumer X's change office facilitates infrastructure changes. The change office conducts weekly online change-advisory board (CAB) meetings. These meetings consist of IT specialists and middle management from consumer X and service provider X. The aim of these CAB meetings is to evaluate proposed infrastructure changes to the wide IT infrastructure ecosystem. Furthermore, the IT operations manager from consumer X and a customer relationship manager (CRM) from service provider X hold weekly meetings to discuss the status of the relationship and to discuss opportunities for improvement. According to multiple

participants, these weekly meetings could be more valuable if the IT specialists were more involved. For example, one limitation of the weekly meetings is that the operations manager and CRM manager only have insights on escalated issues. The case explores these and other key knowledge-sharing challenges experienced by IT employees within these two IT units.

3.2 Data collection and Analysis

This research study employed a purposive sampling method [7]. Semi-structured opened-ended interviews were employed in this research study to collect data. Interviews were allocated for 60 minutes (the shortest interview was 32 minutes while the longest interview was 1h10 minutes). On average, most interviews completed in 50 minutes. All interviews were recorded with the participants' written consent. Face-to-face interviews were recorded using the researcher's mobile phone, while telephonic interviews were recorded using Skype. Table 2 below shows the job titles of the research participants.

Table 2: Job titles of research study participants

Organization	Job title	Number of participants
Consumer X	CIO	1
	IT operations manager	1
	Solutions architecture	1
	IT team manager	3
	IT support analyst	3
	IT environments manager	5
	Applications end-users	2
Service provider X	Customer relationship manager	1
	Operations manager	1
	Linux system administrators	3
Total		**21**

Thematic data analysis was used to identify, analyze, and report patterns within the data [12]. The major sensitizing categories were implicit and explicit knowledge sharing and partnership quality. These categories formed the basis for the case analysis.

4 Case Analysis

The purpose of this study is to explore the major knowledge sharing challenges that are experienced in an S-2-S IT Infrastructure outsourcing relationship. Figure 1 shows that the major challenges related to knowledge sharing in S-2-S infrastructure outsourcing include *IT service delivery quality challenges, information-sharing challenges and quality communication challenges.*
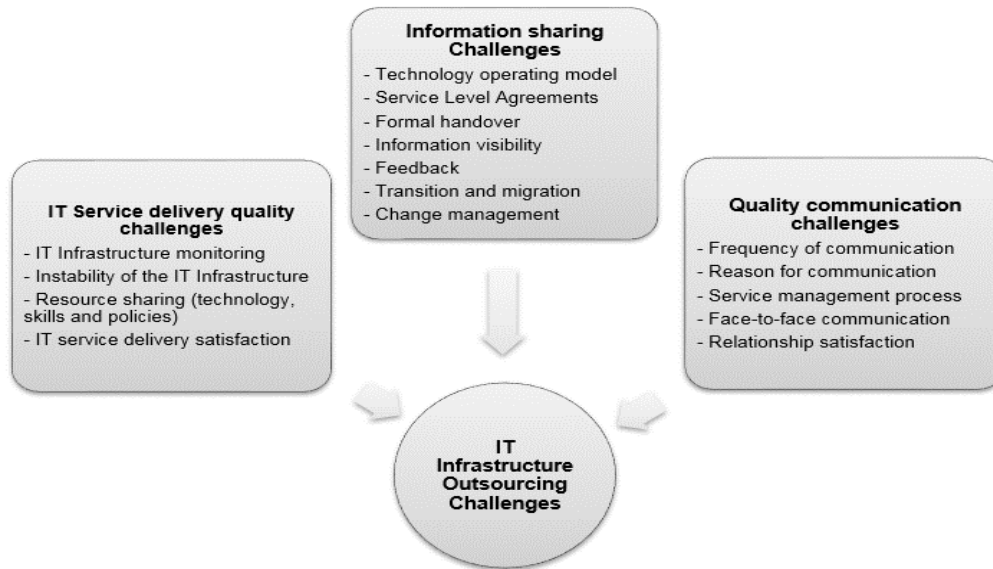
Figure 1: Challenges experienced in an S-2-S IT infrastructure outsourcing relationship

4.1 IT service delivery quality challenges

Four challenges were identified relating to IT service delivery quality challenges, namely, *IT infrastructure monitoring challenges, instability of IT infrastructure, resource sharing challenges, and IT service delivery satisfaction*

IT infrastructure monitoring challenges
It emerged from the interviews that there is a lack of sophisticated pro-active end-to-end infrastructure monitoring. The monitoring that exists is not consolidated and it only covers applications up to the operating system (OS) level. Furthermore, existing monitoring is not offered as a mandatory service. For example, if consumer X needs monitoring enabled on their application or database server, they need to request the service provider to activate monitoring on those IT infrastructures. Participant 8 who is an IT operations manager stated that: *"Service provider X does not seem to be monitoring the infrastructure performance, because most of the time we are only aware of the issue once everything has gone down, issues such as low memory on the server, network outage or low storage on the server."*

Instability of IT infrastructure
The interdependencies of the IT infrastructure means that the technology operating models of all migrated subsidiaries are dependent on one another. One major change or issue to the shared IT infrastructure can affect the entire group and finding the root-cause can be difficult. Participant 18 who is a Chief Operating Officer (CIO) for consumer X stated that: *"Due to multiple infrastructure components inter-linked and multiple tiers (i.e. database server, application server, storage, network, middleware etc.) this makes it difficult to locate the root cause of some issues. This can cause a lot of confusion and delay the resolution."*

Resource sharing challenges
Due to resource sharing, consumer X is required to utilize technology provided by service provider X. In addition, the operations manager from consumer X and the customer relationship manager (CRM) from service provider X confirmed that technology specialists from the service provider X are understaffed as they

have to offer IT services to multiple subsidiaries. Participant 9 who is an IT environments manager stated that: *"Subsidiaries within the group no longer operate in isolation when it comes to IT infrastructure, subsidiaries have to follow the same technology standards and policies. For major technology upgrades or changes all subsidiaries engage and decide on the common goal. There is a lot more conformance in terms of standards, the group needs to always be aligned in terms of the technology they use, this includes the latest technology and application of the latest industry standards."*

IT service delivery satisfaction challenges
Consumer X's IT specialists agree that IT service delivery has reduced since the IT infrastructure migrated to service provider X. According to participant 7, the freeze period occurs every month-end for seven days and every year-end for three months. Participants 7 who is an IT team manager stated that*: "During the freeze period we are not allowed to make changes to the infrastructure. I believe our infrastructure should be excluded from this scheduled freeze period as it does not apply to our business model."* Furthermore, participant 9 added that: *"I would say as an IT service provider you need to be able to operate 24 hours every day. A service provider needs to be responsive and resolve arising issues on time and during odd hours. Our business model depends on the services being online. I prefer my requests to be actioned when I have scheduled them, not wait for an infrastructure slot, that is not agile."*

4.2   Information sharing challenges

Seven challenges were identified relating to information sharing challenges, namely, t*echnology operating model challenges, service level agreement challenges, formal handover challenges, information visibility challenges, transition and migration challenges and change management challenges*

Technology operating model challenges
Different views and understandings of urgency cause conflict between consumer X and service provider X. It appears that consumer X and service provider X lack mutual business understanding of each other's business models and operations. An infuriated participant 17, who is an IT Environments Manager stated that: *"The service provider's year-end freeze starts on the 25th of October and ends on the 1st of February, this is where no changes can go in. That is around three months where we cannot add any changes or modifications to the infrastructure. If you take all their freezers into account, they amount for 4 months of the year."* Furthermore, since the migration of the IT infrastructure, participants from consumer X felt they lacked control over their IT infrastructure. This dual operating model has caused frustrations and increased the service desk log queue.

Service level agreement challenges
Due to the political nature of the relationship between consumer X and service provider X, it has been difficult to put in place service level agreements (SLA) [3]. Many participants from both consumer X and service provider X agree that the lack of an SLA hinders the service provider's motivation to strive for better performance. Participant 4 who is an IT team manger stated that: *"We do not have an SLA in place, the only document we have is the memorandum of understanding, which is basically a gentleman's agreement stating service the service provider renders to us."* To remedy these challenges, a well-written and defined SLA will aid both counterparts to clearly understand their roles in the relationship and strive to honor their end of the bargain. Without SLAs in place, it is difficult to hold both subsidiaries accountable and ultimately measure the success of this outsourcing initiative.

Formal handover challenges

One of the major concerns that emerged when participants were asked about the lack of information sharing was the fact that there was no formal handover conducted during the migration process. Consequently, there was no formal introduction of key contact people from both sides and this has made communication more challenging. Most relationships were formed over a long period, as it was time consuming to establish new working relationships. Participant 3 stated that: *"No, I am not aware if there was any formal handover nor training that taught us how to use their service desk and who to contact when there are issues. All we had was a service desk where you just log a call, and someone will acknowledge it at their own time."*

Information visibility challenges

Participants from both consumer X and service provider X mentioned a lack of visibility on the investment and operating costs. When asked about costs, almost all participants stated that they have no information about whether they are saving or spending more now as opposed to when the infrastructure was hosted in-house. Furthermore, two participants from consumer X mentioned that they are experiencing lack of visibility with the service desk logging process. Participant 8 who is an IT operations manager stated that: *"After I log my call on the service desk, I get an acknowledgement of the call, but after that the only time I hear from them is when the call is resolved, at times I have to wait until they get back to me without knowing if the call will be resolved in 5 minutes or 2 hours. I wish there was a way to know exactly how far they are with my call."* This also related to the challenges around information sharing as the service desk reports show the status of the call.

Transition and migration challenges

IT specialists from consumer X feel as if they have lost control of the infrastructure as they now must liaise with the service provider, even for minor IT infrastructure changes and modifications. The consumer is finding it difficult transitioning to the service provider's technology operating model as it is different from the operating model that they are accustomed to. In addition, during the migration and transition process consumer X lost skilled technology specialists who were transferred to service provider X as part of the infrastructure migration. These IT specialists are currently offering IT services to other subsidiaries as well and no longer offering dedicated IT support to consumer X. Furthermore, during the migration there was a period where the operating costs doubled because the consumer had to run production IT infrastructure on both data centers (at their own data center and at the service provider).

Change management challenges

Furthermore, the new reporting hierarchy delays the decision making process. Since the IT infrastructure outsourcing relationship was established, it takes longer to get to a decision due to more people being involved in the decision-making chain. Consequently, to get to a decision, IT specialists need approval internally and from the service provider, which delays some processes. Participants from consumer X believe that when the IT infrastructure was hosted locally it was easy for individuals to have unplanned short coffee meetings or brainstorming sessions to unravel issues and formulate innovative solutions. Since the migration, this privilege has been taken away due to geographical limitations. Participant 10 who is an IT operations manager stated that: *"Consumer X expects things to work the way they used to when infrastructure was hosted locally, business is used to getting things whenever they want them which they also expect from us."* Participant 5 who is an IT environments manager for consumer X further stated that: *"The service provider does not understand our business needs and the kind of agility and urgency we require for our daily operations."*

Lack of feedback

Lastly, most participants of both subsidiaries claim that there is a lack of regular feedback between management and operational staff. Participants argue that this lack of feedback has opened a gap where management makes decisions on issues having limited operational exposure or inadequate information. In addition, there is lack of regular feedback between the consumer and service provider, meaning that the two parties are not always in harmony. Participant 6 who is an IT support analyst stated: *"I don't think management knows what is going on operationally because they are not the ones that have to deal directly with the service provider. Management is aware of issues when there are serious escalations. Other than that, I don't think they have much visibility or are even interested on daily operations."*

4.3   Quality communication challenges

Four challenges were identified relating to quality communication challenges, namely *reason for communication, service management process, face-to-face communication, relationship satisfaction, and frequency of communication.*

Reason for communication

Rigid communication culture negatively affects building relationships, as effective relationships are built on informal and open-ended communication. This is not the case in this IT infrastructure outsourcing relationship. Most participants from consumer X mentioned that they only communicate with service provider X whenever there are issues or requests and all conversations are work related. Participant 11, who is an IT environments manager stated that: *"I mostly communicate with my stakeholders. This includes my end-users concerning their requests and issues they might be facing on the systems and I also communicate with service provider X concerning infrastructure requests and issues. I am basically the middleman between service provider X and my end-user."* To remedy these challenges, it is recommended that there should be at least quarterly meetings where middle management can discuss outstanding issues, identify areas of improvement, and brainstorm new ideas that will benefit the relationship.

Lack of face-to-face communication

Consumer X and service provider X are in different geographic locations. Participant 6 mentioned that electronic communication does not compare to the power of face-to-face communication. In addition, participant 6 mentioned that for good virtual communication, face-to-face communication needs to be established beforehand even if it is just putting a name to the face. Most of the participants interviewed value face-to-face communication as it provides real time feedback. When the infrastructure was in-house, consumer X's IT specialists would organize a less formal meeting over coffee and brainstorm on some of the troubling issues. Participant 8 stated that: *"I believe that service provider X and consumer X need to have a regular face-to-face communication where they discuss challenges they experience and identify opportunities for growth in the relationship."* Participant 11 has suggested that challenges pertaining to the lack of face-to-face interaction can be remedied with the following suggestion: *"I believe that having a face-to-face meeting with the services provider's contact people would help put a name to the face, this will allow both parties to know who they are communicating with when communicating through electronic channels."* Participant 6, who is an IT support analyst for consumer X based in India, spoke about the value of visiting the South African campus and the opportunity to meet with other IT specialists she has been communicating with remotely. The participant believes that this visit helped improve her relationships with the other IT specialists.

Relationship satisfaction

Many participants believe that the major reasons for lack of a strong working relationship with service provider X is due to the limited physical interactions and informal conversations. Participant 16 believes in

building a strong relationship with service provider X. He believes that a strong working relationship with service provider X will increase the overall service delivery quality. Participant 16 who is an IT support analyst stated that: *"I believe that human connection is important in this kind of a relationship and that service provider X and consumer X need to know and understand each other as they are working together towards a common goal."*

Service management process
Participant 19 further mentioned that top management is too distant from the IT operations and do not know precisely what is going on at that level. One challenge was consumer X's lack of awareness about the formal processes that should be followed when interacting with service provider X. This included processes such as the escalation procedure, service logging process and key contact people. Participant 3 stated that: *"Having multiple modes of communication means that I can communicate with the service provider at any time. In addition, Skype gives me the advantage of seeing who is online or not before I can approach them and another advantage I like is that multiple modes of communication gives me the advantage of choosing which communication mode to use, for instance if during troubleshooting I have to show the user my screen I can just share my screen on Skype and add multiple people on the chat."* A contrary point of view from participant 15 further stated that: *"Having multiple modes of communication works better if well regulated, but here sometimes information is all over the show, you might be talking with a stakeholder about the same things on the service desk, email, and IM. This makes documentation difficult for future reference."*

Frequency of communication
Finally, middle management staff from both consumer X and service provider X only communicates on an ad-hoc basis. Lack of frequent communication between middle management is a barrier to continuous improvement. It has also emerged that having one Customer Relationship Manager (CRM) that oversees all 64 business units with over 3000 servers for the consumer puts a strain on the CRM and overwhelms the entire process. Furthermore, most participants refer to the latter as a single point of failure because if the CRM is absent or overwhelmed with work, work delivery suffers. In addition, most operational employees from consumer X have never had direct contact with the CRM while some employees do not even know that there is a CRM in place. This raises another concern as the operational IT Specialists are the ones that deal with the service provider directly and thereof have implicit and tacit knowledge on how the relationship is performing. Participant 17 expressed his view about the CRM and stated that: *"I have heard that we have a CRM which I do not know who he is or what he does, most of our decision makers do not know exactly what happens on the ground. Sometimes they make decisions and only instruct us on what to do. Honestly I feel like they do not involve us in some of the decision making."*

5 Discussion

This study empirically supports prior studies focusing on the importance of knowledge sharing, communication, and service delivery quality in a subsidiary-to-subsidiary outsourcing relationships [1]. The range of communication channels that are utilized have an impact in conveying the message across. Currently consumer X and service provider X communicate using emails, IM, skype calls, telephone calls and service desk platform for logging and resolving requests, incidents, configurations and change requests. Chen and Huang [12] argue that communication is one of the most important elements of every relationship. Communication as defined by Hamzah, et al. [17] is the act of expressing meaning from one entity or group to another with the purpose of understanding one another. Without quality communication there arise misunderstandings which can result in disasterous outcomes [2]. lack of quality communication could cost the oganisation lots of money, reputation, productivitity and operating licenses just to name a few [2]. Furthermore, since the migration of the IT infrastructure, participants from consumer X felt a lack of control

over their IT infrastructure as it is hosted and managed by the service provider. The two-technology operating model conflict caused frustrations and increased the service desk log queue. This can be remedied by conducting a compulsory information session where both subsidiaries share a detailed overview of their business operations then followed by a Q&A session. Alternatively, a compulsory online training can be arranged that aims at introducing and educating both subsidiaries about the other subsidiaries' business operations.

Nonaka and Toyama [25] argue that a strong relationship between consumer and service provider can help an organization create competitive advantage through the strategic sharing of the organizations' key information and knowledge. Konsynski and McFarlan [21] further argue that intimate relationships are the result of more frequent and relevant information and knowledge sharing within an outsourcing relationship.

This study also confirms prior research that claim that the quality of the IT service delivered can have a positive influence on a subsidiary-to-subsidiary outsourcing relationship. In the case, management from service provider X should be more flexible when managing infrastructure changes. For example, they should allow consumer X the opportunity to work on their IT infrastructure changes and modifications during freeze periods. Furthermore, the service provider can make the freeze periods calendar available to the consumer on time so that they can plan their IT infrastructure changes and modifications beforehand. Alojail and Corbitt [9] argue that the quality of the IT service delivered is considered one of the most important competitive advantages in today's dynamic and customer centric business environment. However, service delivery quality is not a one-way street as effort and commitment are required from both parties [15].

In order to remedy many of these challenges, top management, middle management and IT specialists from both the consumer X and service provider X need to improve their knowledge about each other's businesses operations. This study extends upon Lee's [1] model by bringing in a sharper focus on the role of management support in facilitating information sharing and indeed overall outsourcing success. Management support refers to the active involvement of management personnel of an organization to support the team when they need it [8]. Management support can be achieved when management personnel provide coaching to the team, practice transparent information sharing, remove obstacles that might hinder the team's outsourcing success and lastly, doing everything possible to ensure a successful outsourcing relationship [8]. Technology staff are generally reluctant to voice their opinions and offer positive suggestions. In the case, it appears that only top management can implement changes that empower IT specialists so that they feel more involved in the decision-making processes that influence the S-2-S IT infrastructure outsourcing relationship and ultimately its performance. Overall, managers need to nurture an environment that will enable more effective collaboration to emerge between the different role players involved in order to improve S-2-S IT infrastructure outsourcing performance.

6 Conclusion

This case study explored the knowledge sharing challenges that partners experience in a subsidiary-to-subsidiary (S-2-S) IT infrastructure outsourcing relationship. Information was gathered through semi-structured face-to-face interviews, with IT staff from both the consumer and the IT services provider. Thematic analysis was employed to analyze the data collected from interviews. The study reveals three main knowledge sharing challenges: service delivery quality, information sharing, and communication. Management support is crucial to overcoming these challenges and improving the outsourcing relationship. One of the main limitations of this study is the generalizability of these findings to other subsidiary-to-subsidiary IT infrastructure outsourcing relationship and other types of IT outsourcing relationships. Future research should investigate the impact of knowledge sharing in different IT outsourcing relationships.

ACKNOWLEDGMENTS

REFERENCES

[1] Lee Jae-Nam. 2001. The impact of knowledge sharing, organizational capability and partnership quality on IS outsourcing success. *Information and management*, 38(5), 323-335.

[2] Benitez Jose, Ray Gautam and Henseler Jörg. 2018. Impact of information technology infrastructure flexibility on mergers and acquisitions. *MIS Quarterly*, 42 (1), 25-43.

[3] Chang Young Bong, Gurbaxani Vijay and Ravindran Kiron. 2017. Information Technology Outsourcing: Asset Transfer and the Role of Contract. *MIS Quarterly*, 41 (3), 959-973.

[4] Varajão João, Manuela Cruz-Cunha Maria and Maria da Glória Fraga. 2017. IT/IS Outsourcing in Large Companies–Motivations and Risks. *Procedia Computer Science*, 121 (1), 1047-1061.

[5] Almutairi Moneef and Stephen Riddle. 2018. A Framework for Managing Security Risks of Outsourced IT Projects: An Empirical Study. *Proceedings of the 2018 International Conference on Software Engineering and Information Management,* Casablanca, Morocco, ACM, 40-44.

[6] Benaroch Michel. 2002. Managing information technology investment risk: A real options perspective. *Journal of management information systems*, 19 (2), 43-84.

[7] Yin Robert. 1992. *Case study research: Design and Methods.* Newbury Park CA: Sage.

[8] Young Raymond and Ernest Jordan. 2008. Top management support: Mantra or necessity?. *International journal of project mana*gement, 26 (7), 713-725.

[9] Alojail Moahmmed and Brian Corbitt. 2016. Does the ITIL Service Quality Framework Improve Outsourcing Relationship Outcomes?. *Journal of Advanced Management Science*, 4 (6), 452-456.

[10] Avila Oscar and Kelly Garcés. 2017. Change management support to preserve Business–Information technology alignment. *Journal of Computer Information Systems*, 57 (3), 218-228.

[11] Bahli Bouchaib and Suzanne Rivard. 2003. The information technology outsourcing risk: a transaction cost and agency theory-based perspective. *Journal of Information Technology*, 18 (3), 211-221.

[12] Chen, Chung-Jen and Huang Jing-Wen. 2007. How organizational climate and structure affect knowledge management-The social interaction perspective. *International journal of information management*, 27 (2), 104-118.

[13] Clarke Victoria and Virginia Braun. 2013. Teaching thematic analysis: Overcoming challenges and developing strategies for effective learning. *The Psychologist*, 26 (2), 120-123.

[14] Djemame Karim, Armstrong Django, Guitart Jordi and Mario Macias. 2014. A risk assessment framework for cloud computing. *IEEE Transactions on Cloud Computing*, 4 (3), 265-278.

[15] Eisenhardt Kathleen and Galunic Charles. 2000. Coevolving At last, a way to make synergies work. *Harvard business review*, 78 (1), 91.

[16] Gheorghe Mirela. 2011. Risk management in IT governance framework. *Economia Seria Management,* 14 (2), 545-552.

[17] Hamzah Noradiva, Aman Aini, Maelah Ruhanita and Amirudin Rozita. 2011. Managing knowledge resources in offshore outsourcing firm. *International Journal of Business and Social Science*, 2 (17), 100-105.

[18] Huigang Liang, Jian-Jun Wang, Yajiong Xue and Xiaocong Cui. 2016. IT outsourcing research from 1992 to 2013: A literature review based on main path analysis. *Information & Management*, 53 (2), 227-251.

[19] Imran Muhammad, Bilal Ahmad and Usman Aslam. 2017. Knowledge management strategy: an organizational change prospective. *Journal of Enterprise Information Management*, 30 (2), 335-351.

[20] Koh Christine, Soon Ang and Straub Detmar. 2004. IT outsourcing success: A psychological contract perspective. *Information Systems Research*, 15 (3), 356-373.

[21] Konsynski Benn and Warren McFarlan. 1990. Information partnerships-shared data, shared scale. *Harvard Business Review*, 68 (5), 114-120.

[22] Lacity Mary and Leslie Willcocks. 2017. Conflict resolution in business services outsourcing relationships. *The Journal of Strategic Information Systems*, 26 (2), 80-100.

[23] Lawrence Loh and N Venkatraman. 1992. Diffusion of information technology outsourcing: influence sources and the Kodak effect. *Information Systems Research*, 3 (4), 334-358.

[24] Nonaka Ikujiro and Hirotaka Takeuchi. 1995. *The knowledge-creating company: How Japanese companies create the dynamics of innovation*. New York: Oxford university press.

[25] Nonaka Ikujiro and Ryoko Toyama. 2015. The knowledge-creating theory revisited: knowledge creation as a synthesizing process. *In The essentials of knowledge management (pp. 95-110).* London: Palgrave Macmillan.

[26] Mary Lacity, Shaji Khan and Leslie Willcocks. 2009. A review of the IT outsourcing literature: Insights for practice. *The Journal of Strategic Information Systems*, 18 (3), 130-146.

[27] Statista. 2017. IT functions outsourced worldwide 2017. Accessed October 23, 2019. https://www.statista.com/statistics/662991/worldwide-cio-survey-outsourced-it-functions/.

[28] Weber Ron. 2004. Editor's comments: the rhetoric of positivism versus interpretivism: a personal view. *MIS quarterly*, 28(1), iii-xii.

[29] Yamamoto Shuichiro. 2017. A Continuous approach to improve IT management. *Procedia computer science,* 121 (1), 27-35.