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# **QUALITY OF OUTSOURCED IT SERVICES IN DIFFERENT DEGREES OF OFFSHORING**

Master's Thesis  
in Management and Organization

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## **Preface**

I started in master's thesis group in autumn 2013 and the original intention was to finalize the thesis within a year. However, I got occupied with work and other areas of my personal life. As a result, the process extended to two year project. Despite sometimes feeling long and overwhelming, the project has also been very inspirational and rewarding. Now I am looking at the road back with warm feelings.

I want to thank Ph.D Kirsi Lainema for the support and guidance she gave throughout the thesis writing process. I am grateful for all the comments and advices she gave along the way. I am also glad and humbled by the fact that she kept her interest towards my thesis despite the prolonged timing.

In addition, I would like to thank the friends and family who have supported and encouraged me. Especially my mother, Paula Reinikkala, who has listened about the insurmountable obstacles that I faced, which turned out to be just manageable exactly like she tried to convince me.

Moreover, I want to thank the focal company for giving the opportunity to research the topic. This has been an extremely interesting and chastening project.

Jelena Reinikkala  
October 2015

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# 1 INTRODUCTION

## 1.1 Background

Offshoring signifies the relocation of activities from home nation to abroad. In manufacturing, offshoring started already millennia ago and it has been a strong business trend for decades in ever globalizing world. However, offshoring of services is relatively new phenomenon. (Contractor, Kumar, Kundu & Pedersen 2011; Bunyaratavej, Doh, Hahn, Lewin & Massini 2011.) According to Stringfellow, Teagarden and Nie (2008) offshoring phenomenon spread from manufacturing to services in the late 1990s. By the 2000s, offshoring of services had spread to high value professional and business services, such as IT, banking and financial, as well as medical services. Nevertheless, much of current offshoring research is focused on manufacturing industry, which does not necessary apply to services (Bunyaratavej, Hahn & Doh 2007).

Back in 2004 The United Nations Conference on Trade and Development (UNCTAD) stated that the offshoring of services could be the next global shift (World Investment Report 2004). This shift, which signifies on the other hand the industrial shift from manufacturing to services on a global scale and on the other hand geographical shift from developed to developing nations, is embodied in job and investment flows. At the time of the prediction made by UNCTAD the phenomenon had already attracted wide publicity in the media, but the scale was still relative small. However, growth rate was high and a new business ism was being born. (World Investment Report 2004.) The estimates of the market size vary a lot as most countries do not collect data of these service exports, different estimates include different services, and methodologies vary. However, for example OECD estimated that in 2010 the service offshoring market will have more than tripled from the figures of 2001. (The World Bank 2010.)

In manufacturing industry the speed of offshoring is slightly slowing down. Moreover, there has been media attention on some manufacturing companies returning to home country. This phenomenon, called reshoring, is still very moderate but intensifying. According to The Economist (2013a) in 2009–2011 companies had intentions to reshore 9 % of their manufacturing capacity and for 2012–2014 the figure has already increased to 19 %. In Germany there is one company on average returning back to home nation for every three companies going offshore (Miettinen, Pippuri & Rissanen 2013). In Finland, for example, manufacturing of Lappset parks and production of Aino and Reino slippers has been reshored (Ranta 2011). Similarly, Helkama Velox relocated the production of Jopo bicycles from Asia back to Finland (Miettinen et al. 2013). Never-

theless, reshoring is by no means a mainstream movement in Finland – at least yet (Ranta 2011).

At the moment, services have not been reshoring even on the modest scale seen in manufacturing (The Economist 2013b). However, as noted earlier, the boom for offshoring of manufacturing was followed by the offshoring of services. This gives pause to the thought whether the next development phase of the service industry will also experience the first cases of reshoring. It also evokes the question if managers are just following the latest business trend and making offshoring decisions on herd instinct, or do they really know the relevant factors to estimate what is the best choice for the company. The Economist (2013c) is arguing that most companies do not give enough consideration to this decision. There is a need for more offshoring research to support decision making.

From several perspectives, the Finnish IT service market is at a turning point. One of these aspects is the Indian service providers entering the Finnish market aggressively. In addition, also Western companies provide Finnish clients services that are delivered from India. Finnish organizations are becoming more interested in these services produced offshore, but at the same time certain issues keep them cautious. (Market-Visio 2014.) One of the key concerns regarding offshoring has been its quality. Some argue that services produced offshore do not have adequate quality whereas others testify their superior quality. The controversial evidence makes offshoring an ever more interesting research topic and implies a strong business need for data to support offshoring decisions. Moreover, as service quality is one of the top criteria in service provider selection (Market-Visio 2014), it is important to understand what implications different degrees of offshoring have in it.

The current IT service industry trend lies in global deliveries and, thus, exploring the service quality question from this perspective, is required. IT service deliveries are distributed from several locations, including on- and offshore offices. With the current cost pressure companies are facing, Western IT service providers cannot compete with the Indian companies without utilizing Indian workforce themselves as Indian companies can otherwise offer their services at prices ten times lower compared to domestic production. Thus, to ensure that service engagements are delivered most effectively and with high quality, it is necessary to deepen the knowledge regarding service quality in different degrees of offshoring.

## **1.2 The purpose and scope of the study**

The literature on outsourcing and offshore as well as service quality is already rich. Much empirical studies have been conducted in areas of service quality and many case

research findings have helped us to understand outsourcing. Nevertheless, the statement that Willcocks, Lacity and Cullen made in 2006 related to IT sourcing literature still holds true and describes also service quality literature:

*“[The literature] .... is still marked by inconsistencies, a plethora of concepts, research approaches, ambivalent terminology, and a lack of consistency and common focus across different research groupings.”*

Since the time of publishing that statement, the terminology has become partly more rigorous and some concepts have gained an established position in the IT industry. Nevertheless, some concepts remain ambivalent. There is still no consensus, for instance, on the relationship between service quality, customer satisfaction and attitudes towards service offshoring (Sharma 2012). Moreover, the literature has failed to give clear guidelines and directions for the practitioners, and to establish indicators for them to measure the outcomes. In addition, common focus is still missing across these fields. One can find plenty of studies related to different types of outsourcing and even more studies related to service quality. However, the studies on service quality in different delivery modes are more difficult to find. Moreover, the studies which can be found are overshadowed by inconsistencies.

This study will focus on the interception of these two research fields, investigating the service quality in different delivery modes of IT services. The study is explorative in nature and in the beginning of the study process the research question was also left vague. The purpose is not to find out which delivery mode has the superior quality or what would be the optimum degree of offshoring. Rather, the aim of this study is to learn more about the phenomenon and service quality within the different degrees. By exploring these topics the study aims to contribute narrowing the research gaps discussed below.

The degree of offshoring refers to the intensity in which offshoring is realized. It is a continuum of zero percent offshoring (onshore) to hundred percent offshoring. For the sake of simplifying and rationalizing, it can be categorized to three different delivery modes: i) onshore delivery, ii) collaborative delivery and iii) offshore delivery. In onshore deliveries the IT service is delivered from the same country where the company that acquires the IT service is located in (in this study Finland). In offshore deliveries it is delivered from another country (in this study India). In collaborative deliveries it is delivered in collaboration of these two. Offshore and collaborative deliveries could involve several foreign countries, but this study concentrates only in India as an offshore location due to its prominent role in the focal company and in the market in general (see chapter 2.4).

The data for the analysis is provided by a local subsidiary of large multinational technology and consulting enterprise. The study focuses only on outsourced IT services, and more specifically on application management services (AMS). The primary data is retrieved from incident management system, which is an AMS tool, and it is analyzed with quantitative methods. The data captures AMS that are delivered from the onshore (Finnish) unit, from the offshore (Indian) unit, and services Finnish and Indian units deliver in collaboration. Interviews are used as a secondary data in this study to deepen the understanding over the themes that are available for analysis via the incident management data.

The practical implications of this study are explicit and manifold. Managers seek for accurate information on which to base their offshoring decisions on. As the competitive positioning is changing in the IT consulting industry, the study will give insight on the resourcing models that will help the actors to perform better in the dynamic marketplace. In many cases the prevailing question is not whether to offshore, but how to deliver the offshore engagements in the most effective way.

According to Gartner's analysis the offshore service market continues to evolve and the future lies within global sourcing (Jester 2004). In other words, companies will leverage more often personnel from several locations. For instance, a service for Finnish client can be delivered in collaboration of Finnish, German, Polish and Indian employees to create the best fit to the client's needs, including cost preferences and skill level required for each task. The comparison of the different degrees of offshoring serves this future vision as the study may indicate quality issues which have to be solved to perform the service effectively in collaboration with resources from various countries. Moreover, taking the significant role of IT into account in any organization, making IT services more efficient does not only benefit the IT service providers but also adds value to almost any business.

In addition, as the current trend in offshoring and reshoring demonstrate, there is need for this kind of research on a higher societal level as well. There is more and more cost pressure towards IT consultancy companies, which drives them to rather exploit the Indian resources than the Finnish resources. This implies changes to Finnish consultant's job content in the future. The Minister for European Affairs and Foreign Trade of Finland<sup>1</sup>, Alexander Stubb (2013), argues that Finland cannot compete with production costs and, hence, Finnish companies must find a role which provides value added in the global supply chain. The Finnish IT consultant's role is likely to change towards busi-

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<sup>1</sup> Stubb was the Minister for European Affairs and Foreign Trade of Finland at the time of the article was published. After that Stubb has served as the Prime Minister (2014–2015) and as the Minister of Finance (from May 2015).

ness partner with focus on business processes and industry knowledge rather than solely technology specific expertise, which can be provided from India with a lower cost.

The study at hand provides new knowledge for the basis of considering different offshoring options. Thus far, studies have mainly concentrated on the offshoring questions from “go or no go” perspective, but have not considered middle-range options and various degrees of offshoring. For instance Contractor et al. (2011) studied the optimum degree of outsourcing, which acknowledge that there is cooperative option in between of in-house and outsourcing options. However, most offshoring literature has not taken into account the corresponding option for offshoring. Therefore further research and comparison is needed, and the topic of this research has been chosen in order to clarify and study this field more thoroughly.

This study is structured as follows: first the backgrounds of offshoring as a phenomenon are covered. This chapter will introduce the concepts of outsourcing and offshoring. In addition, the differences between offshoring of manufacturing and offshoring of services will be briefly discussed. Also, India is described as an offshoring destination. Secondly, the case under study, that is the focal company and its services, are presented. All in all, the first chapters explain the overall framework and main concepts related to the delivery modes and application consulting. Then the study moves on to focus on the other field relevant for this study – service quality. In this chapter previous literature on service quality is presented and suitable measurement frameworks are introduced. After that, the methodology and data are described, followed by a chapter discussing the research findings. The limitations and trustworthiness are evaluated along the findings. Thereafter conclusions are drawn based on the empirical study and previous literature. In addition, suggestions for future research are given. Finally, summary concludes the study.

## 2 OFFSHORING PHENOMENON

### 2.1 Outsourcing and offshoring

It is important to first define the terms outsourcing and offshoring, because one can see often these concepts being misused. Contractor et al. (2011) determine offshoring as “the geographical relocation of activities outside the home nation of the firm under any organizational arrangement, including the foreign subsidiaries of the company, foreign alliance partners or foreign contract providers”. Sourcing, global sourcing and international sourcing are sometimes also used as synonyms for the offshoring phenomenon (Pore 2009). Outsourcing, on the other hand, “refers to value added by contractual external providers, whether in home nation of the firm or foreign nation” (Contractor et al. 2011).

Thus, in offshoring geographical boundaries are crossed whereas outsourcing applies to the crossing of organizational boundaries. These two are not dependent on each other. In other words an outsourced service may or may not be offshored, and vice versa an offshore service may or may not be outsourced, as can be seen from Figure 1.

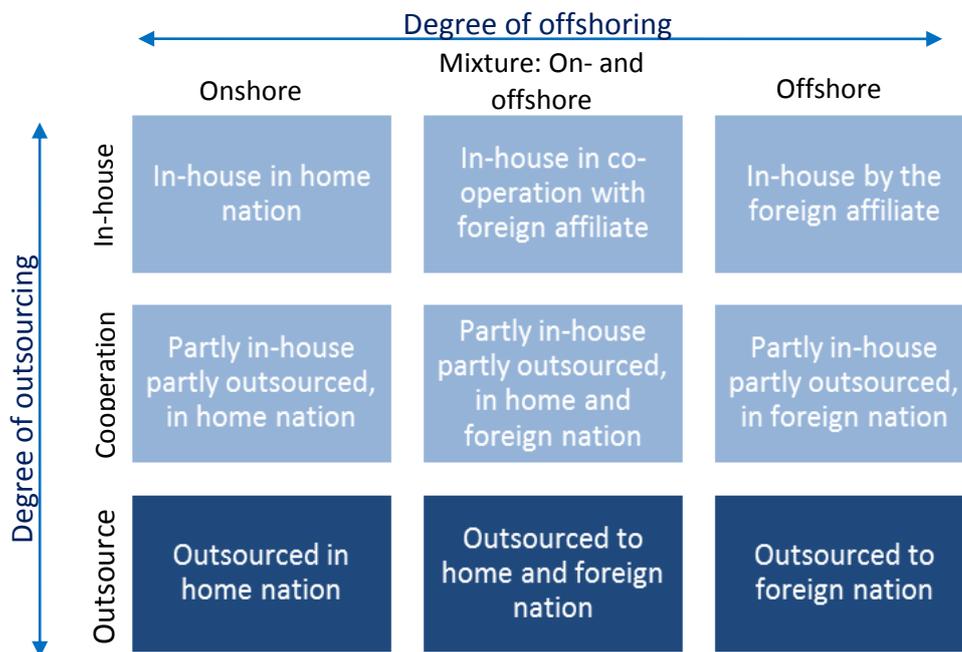


Figure 1 Outsource/offshore matrix

The outsource/offshore matrix (Figure 1) demonstrates the different combinations available for outsourcing and offshoring. The rows determine where the activity is performed from perspective of organizational location, i.e. whether it is done in-house, in collaboration with a third party, or whether it is wholly outsourced to a third party. The

columns tell the geographical location, i.e. whether the activity is performed onshore, on- and offshore, or offshore. Offshoring that is executed internally by moving activities from a parent company to its foreign affiliate is sometimes referred as captive offshoring. Alternatively, if the offshored service is provided by a third party, it is called outsourced offshoring. (World Investment Report 2004; Lewin & Volberda 2011.)

Previous studies have concentrated mostly on a two-by-two matrix, which has only yes and no options for outsourcing and offshoring (Bunyaratavej et al. 2011). Outsourcing is sometimes even called “make-or-buy” decision, demonstrating its traditionally recognized two dimensional nature, which ignores the co-operational option. However, some authors acknowledge a third dimension for outsourcing, i.e. that activities are done in-house, in cooperation with a service provider or outsourced fully (see, for example, Contactor et. al 2011, 7).

Currently, however, there are few studies that discuss the co-operational option of offshoring even though it is common in practice at least in the IT service industry. For example Oshri, Kotlarsky and Willcocks (2011) acknowledge three options for the location decision, but from a different perspective. They have divided the location side of the matrix on the basis of whether the function is performed on the client’s premises. Thus, they have two options for delivering the service from the home nation (on-site or off-site) and one option for delivering it from a foreign nation (off-site). On the other hand Pore (2011) examines the different modes of offshoring, such as joint venture, licensing and complete externalization, but not the collaboration between different nations in service delivery. Therefore, this study has a unique approach that provides new information on the research topic.

This study will focus primary on outsourced IT services and, therefore, the in-house and cooperation rows of the outsource/offshore matrix are left out of the scope. The scope of the study is highlighted with a darker color in Figure 1. The degree of the offshoring refers to different geographical locations from which the outsourced IT service is delivered. Thus, this study does not take a stand on the different modes of offshoring discussed by Pore. In other words, this study does not focus on assessing the feasibility of, for example, joint venture, licensing or complete externalization. This is due to the fact that in the IT consultancy industry these variations are not that relevant. For the cases analyzed, the mode between the client and the service provider did not vary; the business is constructed as a client-supplier relationship in all cases. The on-site and off-site variations, acknowledged by Oshri et al., are also left out of the scope of the study at hand. Regarding the analyzed data, both on-site and off-site were used in situations where the Finnish unit was involved with delivery and mostly off-site was used in the offshore deliveries.

## 2.2 Characteristics of service industry

Much of previous research has focused on manufacturing outsourcing and offshoring. However, offshoring of outsourced manufacturing and offshoring of outsourced services is fundamentally different (Lewin & Volberda 2011). Due to their divergent natures, research related to manufacturing does not necessarily apply to service trade (Bunyaratavej et al. 2007). Blinder (2006) argues that the offshoring of services is the third industrial revolution; first one being the shift from agriculture to manufacturing and second from manufacturing to services. Due to the emergent role of service offshoring, a more fundamental understanding of the phenomenon is needed. One of the purposes of the thesis is to contribute in this discussion.

The decision regarding the degree of offshoring may be distinct for services and manufacturing, because the factors affecting their location decision differ. While some factors, such as the level of labor costs, are important for both industries, some other factors vary greatly between manufacturing and services. (Bunyaratavej et al. 2007.) These differences between manufacturing and service companies are summarized in Table 1. Manufactured goods are usually delivered to a customer with trucks, airplane, train or ship and therefore the relevant infrastructure needs to be in place. These transportation infrastructures are not, in comparison, as relevant for services. The delivery of services happens electronically, making ICT a far more important factor. (Bunyaratavej, Hahn & Doh 2008.) This is especially the case in the industry discussed in this study.

Table 1 Differences in location consideration in manufacturing and service offshoring  
(adapted from Bunyaratavej et al. 2008)

	Manufacturing	Services
<b>Infrastructure</b>		
<b>Physical infrastructure</b>	Road/ airport/ railway	Telecommunication technology
<b>Human capital</b>	Low skill workers	High skill workers; education level is key attraction
<b>Location-specific factors</b>		
<b>Political risk</b>	More vulnerable	Less vulnerable
<b>Local market and/or proximity to major markets</b>	More relevant	Less relevant
<b>Government policy</b>		
<b>Government incentives</b>	More relevant	Less relevant
<b>Set-up cost</b>	High	Low

In manufacturing, some key roles require highly skilled and more educated personnel. However, most positions, such as assembly, require more moderately skilled employees without advanced education. Knowledge intensive services, on the other hand,

rely heavily on human capital. Thus, service offshoring is dependent upon abundance of knowledge workers. The employees need to have more advanced education and higher competencies in a wide range of areas. In addition, often excellent communication, language and people skills are required as personnel are usually in contact with the customer. Moreover, developed technological skills and subject matter expertise are also presumed. Also, a broader understanding of firm mission and firm competitive environments are usually required. (Bunyaratavej et al. 2007; 2008.) All these requirements stand in IT consultancy industry where the consultant is directly in contact with the customer. In addition to technological skills, subject matter expertise is required. For instance SAP consultant focusing on the SAP Finance & Controlling module has to have subject matter expertise in areas of finance and accounting. Moreover, the consultant has to understand the client company's business as the distinction between IT and business has blurred and along it IT professional's role has changed. Nowadays IT service providers are trying to *integrate* IT with the client's business whereas previously the goal was to *align* IT with the business. The business perspective is always present in IT solutions. In addition, communication skills enable good collaboration with the onshore team and client.

Other differences include the relation towards political and business risks. As offshoring involves utilizing resources abroad and often especially from developing and emerging countries that have been historically more volatile, unstable, unpredictable and less transparent, the business faces risks at the offshoring location (Carmel & Tjia 2009). Since manufacturing is capital intensive and immobile, it is more vulnerable to political risk than services (Bunyaratavej et al. 2008). Some examples from history demonstrate this. For instance during the Yugoslavian war, an IT service offshored from Amsterdam continued without disruptions in spite of the ongoing bombing. Similarly, the near war between India and Pakistan in June 2002 or American invasion of Iraq in 2003 in response to 9/11 WTC attack did not have serious impact on offshoring. (Carmel & Tjia 2009.) Nevertheless, there is some political risk also affecting the service industry. For example, the recent tax disputes between several multinational corporations and Indian tax authorities make the business environment unstable in India for organizations regardless of their field (Crabtree 2013). Yet another example is the law that Russia proposed in the spring 2014 to seize Western companies' assets in respond to sanctions imposed on Russia over the Ukraine crisis (Mauno 2014). Similarly internet censorship in China can impede doing business in the country. Multinationals use VPN to safeguard their business transactions, but despite that, occasionally their transactions also get affected by "The Great Firewall". (McDonald 2012.) Thus, political decisions can also risk service businesses to some extent.

Manufacturing is also more vulnerable to business risk in a sense that the companies in the industry often aim to exploit the local market or the market near the manufactur-

ing location (Ellram, Tate & Petersen 2013). Manufacturing companies are, therefore, concerned about factors such as income per capita, consumption, and population. Service companies, on the other hand, usually do not aim to serve the local market, and as a result the economic variables of the location are less important (Bunyaratavej et al. 2008). This holds true especially in IT services where the clients are located mainly in developed countries but the service may be delivered from an offshore location. For the same reason, local economic cycles do not significantly affect the offshored IT service business. Moreover, government incentives are more relevant to attract manufacturing investments than to attract service investments. Service business does not benefit from, for example, free trade zones. Another factor differentiating manufacturing and services is the initial set-up cost which is high for manufacturing and low for services. (Bunyaratavej et al. 2008.) All these factors demonstrate how different the industries are by nature and, hence, why it is important to have research within service industry and not only within manufacturing.

### **2.3 Offshoring drivers and deterrents**

As discussed earlier, the offshoring of manufacturing began considerably earlier than the offshoring of services. The advances in information and communication technology (ICT) have enabled the offshoring of services. Economic theorists divide the objects of trade to tradable and non-tradable; tradable being the ones that can be offshored. Traditionally, roughly speaking any item that could be put into a box was considered tradable and items that could not be packed into a box or were too heavy to ship were thought as non-tradable. Thus, most manufactured goods fall into the first category and services to the second one. However, as technology is improving and transportation becoming easier and cheaper, the boundary between these two categories, is constantly shifting. To be more specific it moves to only to one direction as an increasing number of items become tradable. Moreover, the traditional assumption that tradable items are those which can be packed into boxes does not hold true in the modern world. Rather, the key distinction will be between services that can be delivered electronically and those that cannot. (Blinder 2006.)

In addition, IT service industry has industrialized just as the manufacturing industry has before (Siltala 2013). Industrialization is a combination of globalization, maturity of processes, and automation (Hammarsten 2013). Moreover, international certifications and adaptation of processes such as Six Sigma have legitimized offshoring as a potential strategy in the eyes of the decision makers by ensuring an appropriate level of security and sufficient assurances of business continuity (Dossani & Kenney 2007). Providing IT services from the home nation was originally the default, but the improvement of

ICT, the industrialization of the IT industry, and the availability of international certifications have shifted the status quo. These three phenomena have contributed in enabling the IT service offshoring. In addition, there are several affairs that further drive service offshoring and, on the other hand, several deterring it. The main drivers and deterrents of offshoring are introduced in the following pages.

Traditionally, the ultimate driver for offshoring has been seen in the search for lower costs (see for example Roza, Van den Bosch & Volberda 2011). In an Offshoring Research Network (ORN)<sup>2</sup> survey the number one strategic driver of offshoring was taking out costs with 93 % of the respondents citing it important (Lewis & Peeters 2006). The most important savings, especially in human capital intensive service industry, comes from labor costs. The direct and indirect labor costs, for instance, in India are far less than in the developed nations. The average salary of an Indian computer programmer is only USD 5 880–11 000 annually (Garner 2004), which translates to approximately 4 300–8 000 EUR. As for Finland, according to the labor union of IT sector, the minimum salary of computer programmers is 25 000–43 400 EUR annually depending on the level of the employee (Tietoala TES 2012). Thus, the Finnish programmer may have a salary ten times higher than his/her Indian counterpart. In addition, other employee related costs, such as health insurances and pension contributions, are likely to be higher in Finland. Today the service industry is able to take advantage of the global labor arbitrage that manufacturing industry has exploited for decades. For human capital intensive companies, where labor cost account for a substantial share of the total costs, the possibility to leverage less expensive workforce is appealing.

In addition to the lower cost level, cost advantage can be found through around-the-clock operations. Service accessibility can be provided with substantially lower cost when personnel from several time zones are utilized and expensive evening and night shifts can be avoided. Moreover, the time to market can be reduced with around-the-clock operations as the work of an employee can be continued from another time zone.

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<sup>2</sup> ORN studies the offshoring of administrative and technical work to low-cost countries. The overall objective of ORN is to track the adaptation of offshoring administrative and technical functions over several years with a biannual survey. The first ORN online survey was launched in November 2004. The survey was targeted to executives and functional managers of 650 US Forbes Global 2000 companies that were contacted by email. A total of 90 companies completed the survey (14 % response rate). The sample included companies that were offshoring at the time of the survey (70 %) and companies that were not offshoring at the time (30 %). The sample included both manufacturing and service industries. Following the administration of each survey, participating companies are invited to debriefing workshops and some companies selected for further in-depth case studies. The workshops and case studies provide more fine-grained and nuanced information on the topic.

(Stringfellow et al. 2008.) This is also relevant in IT service industry where the level of service is usually contractually agreed with Service Level Agreement (SLA) specifying, among other issues, the times when service has to be available and how promptly the service provider has to respond to service requests and solve incidents. The desire to improve service levels was ranked the third (with 56 % of the respondents selecting it) most important driver for offshoring (Lewin & Peeters 2006). In the case of Finland and India, it has to be kept in mind that the time difference is only 3.5 hours. Thus, it does not fully support around-the-clock operations and enhancing SLA. However, the overlapping time, which Finnish and Indian colleagues spend at work, ease collaboration. Most likely this benefit outbalances the missed advantage that greater time difference would provide.

There are some so called invisible or hidden costs that may hinder the advantages of the lower wage level. Invisible costs refer to the costs that are not always apparent to firms making the offshoring decision. Often the invisible costs come as a surprise to the client and, therefore, the planned cost savings may not materialize fully. According to Stringfellow et al. (2008) invisible costs are influenced by interaction intensity and interaction distance. Interaction intensity means the degree to which clients interact with service providers and it is largely defined by service content and service processes. Interaction distance is, on the other hand, a barrier that results from the combined effects of geographical, cultural and linguistic differences. On a practical level invisible costs can be a result of, for example, client dissatisfaction and loss of sales due to miscommunications or misunderstandings, increased travel costs, and ineffective interaction due to time differences or language barriers. Stringfellow et al (2008) conclude that they can be categorized into (i) invisible costs associated with reduced customer service quality and (ii) invisible costs due to ineffectiveness. Similarly, Sjöblom (2012) argues that loss of quality is one form of invisible cost when application service is delivered with offshore resources. There has been also some evidence from practitioners on the lower quality of work and lower productivity of offshore units (Vänskä 2012). These findings are highly interesting from the perspective of this study. In addition to the invisible costs, managing a service from offshore location introduces additional governance costs (Stratman 2008).

Despite the additional governance costs and the invisible costs companies may be able to reduce the total cost level below the home country level (Roza et al. 2011; Pfannenstien & Tsai 2004). Nevertheless, the salaries of IT personnel and other costs in India are reported to be rising at 10–20 percent a year (Weidenbaum 2005; NASSCOM 2005) making the potential cost savings less significant year after year. However, it can take decades before the labor arbitrage would have vanished and, thus, the growth rate of Indian salaries does not hinder the offshoring phenomenon substantially.

Even though cost reduction continues to be one of the primary reasons behind offshoring, it is not by any means the only one (Ellram et al. 2008). For instance the Finnish forestry corporation UPM stated that in addition to the price factor, one of the main reasons for selecting an Indian IT service provider instead a domestic one was their service-oriented attitude (Kerkkänen 2013). Thus, some drivers are related to the resources available at the offshoring location, not just to their costs. The drivers and deterrents discussed in this chapter are summarized below in Table 2. As the drivers stem from different perspectives, several theories like transaction cost economies, resource-based view and entrepreneurship theory are linked to the topic.

Table 2 Offshore drivers and deterrents related to them

Offshore driver	Examples	Deterrents
<b>Cost driver</b>	Lower labor and other costs Service accessibility	Invisible costs Governance costs Rising labor costs Lower productivity
<b>Resource driver</b>	Gaining access to qualified personnel Business process redesign Improved service levels	High turnover of employees Motivational issues Lack of business environment understanding
<b>Entrepreneurial driver</b>	Part of larger global strategy Increasing speed to market Differentiation strategy Access to new markets	Unstable business environment in developing countries

Gartner<sup>3</sup> argues that offshoring services have been driven by cost-saving potential but as industry evolves, they become ever more driven by a need to use the best resources and achieve the best quality at the best price (Jester 2004). Several other researchers have come to the same conclusion (see, for example, Ebrahimi 2009; Oshri, et al. 2011). The resource driver is discussed in more details regarding India in the following chapter.

The turnover of employees is typically higher in offshore locations than in Finland. For instance, Indian operations in business processing often lose 15–20 percent of their workforce every year (Weidenbaum 2005). The high turnover is likely to impede quality as the service lacks continuity. Many companies understand the risk that high turnover create. For instance, in the ORN survey 44 % of the respondents cited employee turnover to be an important risk of offshoring. Moreover, the companies with offshoring experience considered it as one of the highest risks (52 % of them evaluated employee

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<sup>3</sup> Gartner is a respected IT research and advisory company providing technology related insight.

turnover as important risk) whereas companies with no offshoring experience yet did not perceive it as relevant (25 %). (Lewin & Peeters 2006.) This implicates that high turnover does have negative consequences in reality and that often companies are not prepared for them.

Another deterrent, and perhaps one reason for the high employee turnover, is motivational issues related to offshore work. Traditionally offshoring employees have been assigned routine tasks, but offshore employees have started to insist being involved in the more mission-critical projects that motivate them. They expect to be treated as valuable resources to the organization and not merely cost-cutting commodities. In addition, greater level of leadership is required to motivate, direct and engage talented individuals located offshore. (Ebrahimi 2009.)

## **2.4 India as an offshoring location**

India is a world-leading destination for offshoring activities as it has approximately 43 % market share followed by China and Philippines (Chauchan, Dwivedi and Sherry 2012). The share is even higher within offshored IT work as India possessed 65 % of the market in 2008 (The Economist 2013d). The IT and business process outsourcing and offshoring industry has a remarkable role also for the nation's economy; accounting for approximately 6.4 % of its GDP, about 26 % of export revenues, and over two million jobs in 2011 (World investment report 2011). The current industry trend in IT services is distributed deliveries. This signifies that the service is delivered from several locations. India has a key role in these distributions. Globally successful IT service providers from Western countries, like Accenture, Capgemini and IBM, have more employees in India than in the company's home nation. For all of them, the Indian workforce constitutes about a third of the group overall workforce. (Phandis & John 2013.)

Software activities started to globalize in the 1990s with India, Ireland and Israel successfully gaining market shares. These nations became global centers of software activities, each specializing in different aspects of the field. However, the two other "I"s have not been able to grow their importance as an offshoring destination in similar way as India has. (Carmel & Tjia 2009.) India has been successful in offshoring for several reasons. First of all, it has large labor force that is available at a low cost. As discussed earlier, the savings from salary and other expenses can be tremendous if the work is done from India rather than onshore. According to Dossani and Kenney (2005) a multinational enterprise reported up to 80 % cost savings when it transferred some of its operations to India. Secondly, their English skills enable them to conduct business with the client regardless of the client's home country (World investment report 2011). Even

though Hindi is the most widely spoken language in India, English is the most important language in business and politics (Manu 2011; India.gov profile).

In addition to their English skills, the Indian workforce encompasses technical skills needed in the IT sector. The country has 1 200 technical colleges with 400 000 engineers graduating each year. However, among those only a fourth has been argued to have the skills to immediately start work at a multinational or major Indian IT firm. (Lakshman 2007; NASSCOM 2005.) Nevertheless, even a fourth of the figure is massive amount of competent graduates entering the workforce every year. Furthermore, the number is rising at an accelerating rate as more students select the field, as the IT service industry provides appealing career opportunities, and as the demand for workforce continues to grow (Youngdahl, Ramaswamy & Dash 2010). In comparison, only about 40 000 to 50 000 degrees are conducted each year from the Finnish universities and universities of applied sciences in total, including *all* fields and *all* levels of degrees (Tilastokeskus ammattikorkeakoulutus; Tilastokeskus yliopistokoulutus).

Moreover some of the Indian high tech universities, such as the Indian Institute of Technology (IIT), are argued to have equally high quality of education and international prestige as MIT, Stanford and Harvard has (Haniffa 2005). The selectivity rate of IIT, which is only 2 %, ensures the level of the students accepted to the university (Carmel & Tjia 2009). Thus, it does not come as a surprise that researchers have acknowledged a change in offshoring behaviors. Companies are offshoring to India to gain access to qualified personnel (at a low cost), rather than to only reduce costs. In the future, India will be seen ever more as a destination for excellence. (See, for example, Ebrahimi 2009; Oshri, et al. 2011)

A.T. Kearney publishes annually the Global Location Index, which contains the analyses and rankings of the top 50 countries worldwide as the best destinations for providing outsourcing activities, with special focus on IT services and support, contact centers and back-office support. The index is based on three categories, which are financial attractiveness (constitutes 40 % of the total weight in the Index), people skills and availability (30 %), and business environment (30 %). Each category is divided into three or four subgroups which all have several metrics for measuring the country's performance in that area, building a reasonably comprehensive<sup>4</sup> basis for evaluation. India, performing well in all three categories, has been ranked first since the inception of the

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<sup>4</sup> Parameters for location decisions are not discussed in greater detail in this thesis as they do not fit the scope of the study. For more comprehensive frameworks see, for example, Carmel, E. (2003) The new software exporting nations: Success factors. The Electronic Journal on Information Systems in Developing Countries, Vol. 13 (4), 1–12 or Farrell, D. (2006) Smarter offshoring. Harvard business review, Jun2006, Vol. 84 (6), 84–92.

Index in 2003. There are several other popular offshoring destinations as well, but benefiting from its first-mover advantage India remains the unquestionable industry leader. (Global Services Location Index 2011).

In addition to, or perhaps one key reason for, staying at the top of the rankings, India has been able to evolve its industry. At first, their service offering concentrated more on batch processing tasks that were based on instructions given by clients or onshore colleagues. Now they have matured to co-developing knowledge-based products and services. The development from low value (back office) to high value functionalities (front-office) is evident in India but can be also seen in other offshoring destinations. Accelerating growth has been experienced in the number, diversity and complexity of functions being offshored as firms learn to manage better cultural, technical and operational challenges associated with offshoring (Lewin & Peeters 2006). Indian offshore service providers have experienced substantial growth over three decades, now offering services to two thirds of the global Fortune 500 companies. (Youngdahl et al. 2010.)

Not only have the Indian companies and workers learned important lessons from working with western companies and the western companies learned about managing the offshoring relationship better (Lewis & Peeters 2006), but also the Indian work environment has evolved. Youngdahl et al. (2010) argue that the Indian offshoring business has evolved along with economic development and cultural changes. Economic development affects culture as it boosts the rise of knowledge society that shifts from survival values to self-expressional values, enables better education and through socio-economic development gives rise to a sense of social autonomy. (Youngdahl & Ramaswamy 2008; Youngdahl et al. 2010.)

Youngdahl et al. (2008; 2010) propose an evolutionary model of offshoring operations. At the first stage, the offshored services are routinized and strictly timed. The offshore roles related to these tasks go well with cultures that have high power distance and low individualism scores. These cultural dimensions have traditionally characterized Indian culture. At the second stage, offshored operations are evolved from task performing to solving complex business problems. In this type of working high power distance can be a problem while collectivism may be an advantage (as long as it does not result in groupthink). At the third stage, which is “global service center” that masters a variety of services, teamwork is emphasized. Here lower individualism scores can be beneficial to support collaboration, whereas high power distance can hinder it. The Indian business context has changed in a short time to offer a fertile landscape upon which service operations on higher stages can be built. (Youngdahl & Ramaswamy 2008; Youngdahl et al. 2010.)

### 3 APPLICATION MANAGEMENT SERVICES

#### 3.1 The focal company and its services

The focal company is a large multinational technology and consulting enterprise. It is a western company, but similarly to its competitors, it also has a large employee base in India. The Finnish subsidiary, which granted access to the data analyzed in this study, provides IT services for their clients in Finland. These services can be delivered from Finland, offshore location(s) or in combination of these options. Most of the time off-shore resources are from India. The Indian employees working for Finnish clients form a talent pool that focuses mainly on clients in Finland. Globally the company is one of the world's largest in its field and it holds a strong market position also within the Finnish market.

The services provided by the focal company include, but are not limited to, application management services (AMS), which this study focuses on. In Finland a significant share of the company's revenue in technology services comes from AMS. Moreover, according to Market-Visio<sup>5</sup> (2013b) application management is the fastest growing area of IT services in Finland. AMS contain application maintenance and development services. Maintenance services include activities like preventive maintenance, corrective maintenance, emergency fixes and user support. Development services, on the other hand, are enhancements into the application or processes and can be requested by the client or proposed by the service provider. Major enhancements are not usually included in the service scope but managed as separate projects.

The data was collected from AMS related to SAP, which is one of the world's most used Enterprise Resource Planning (ERP) software. A stunning 63 % of worldwide financial transactions are estimated to be processed through it at one point or another. It is especially popular among large enterprises; nearly 80 % of the Fortune 500 companies use SAP software for at least some of their processes. (Lev-Ram 2012.) Similarly, SAP enjoys popularity in Finland. It indirectly affects even the consumers' lives as the software holds a strong position in the retail market and, therefore, the majority of business transactions required to have food on the shelves of grocery stores, go through SAP.

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<sup>5</sup> Market-Visio Oy is a Finnish advisory and research company focusing on ICT field. Gartner acquired Market-Visio in March 2014.

### 3.2 Incident management

The work done within AMS is usually structured in incidents, which can be described as the service requests or assignments set for a consultant. Thus, incident can be seen as the basic unit for dividing work and handling the client's needs. The research data used for quantitative analysis in this study constitutes of incidents. ISO 20000 standard defines incident as an unplanned interruption to a service, a reduction of quality of a service or an event that has not yet impacted the service to the customer. The incident can be detected by an individual (an end user from client organization or an employee of the service provider), or it can be caused by an infrastructure event. In infrastructure events an automatic monitoring tool sends alarms, for example if a batch job run fails, for which incidents are created. When the incident has been detected, the service desk operated by the service provider creates the incident into incident management software with all the currently known details. This is the first step of the incident management process, illustrated in Figure 2.



Figure 2 Incident management process

The incident can be a variety of things. For example, the client can raise an incident if SAP does not generate an invoice for a supplier. This could be, for instance, due to user error when giving parameters for invoicing or due to incorrect data specified in the vendor master record. Similarly, an incident could be opened if an intermediate document (idoc) transferred from another system into SAP has resulted in error. This could be due to, for example, an incorrect data format used in the idoc, which SAP cannot read. On the other hand incident does not necessarily indicate there is an error in the current system, data or user activities. It can also be a request to create additional data or functionalities in the existing system, for example to create a new general ledger account in SAP.

After the incident is created in the system and details, such as the description of the issue, have been recorded, it is prioritized and classified. Priority is determined by the impact and urgency of the incident. The priority determines the response times given to the service provider. These times are based on Service Level Agreement (SLA), which is a contractual document that describes the level of service that is agreed between the customer and the service provider. It lays out the metrics, which are used to measure whether the agreed-upon level is achieved and it may also include possible remedies or

penalties and rewards. SLA states, among other metrics, the time within the supplier have to take an incident into progress and the maximum time when it has to be solved.

Different SLA times are defined for different priorities. The higher the priority (i.e. the wider the business impact of the incident and the more urgently it requires a resolution), the faster it needs to be solved to achieve the service level agreed in SLA. Later in this study the resolution times and achieving of SLA times are examined. Classification, on the other hand, is used to identify where the object lies. It enables assigning the incident to the correct consultant and informs the consultant what system/ software it concerns. For instance the above mentioned incident example related to vendor invoice, could have classification details referring to the client's production environment and Accounts Payables sub-module from SAP Finance and Controlling.

The incident is then assigned to an individual consultant or to a team of a specified expertise area. For example the issue related to Accounts Payables would be assigned to the team specialized in SAP Finance and Controlling (FI/CO) module or to an individual belonging to that team. A consultant will then take the incident into progress, i.e. investigate what is the cause of the issue and how to solve it. If necessary, the consultant can also ask more details from the client. When waiting for client's reply, the incident is put on hold and the agreed SLA time does not run as long as the consultant is pending for information. This step also includes updating all relevant details and progress into the incident records. Finally, the resolution is achieved and when it has been confirmed by the client, the incident is closed.

### **3.3 Service delivery models: the degree of offshoring**

Application services in Finland are acquired more frequently than before from nations which have lower cost level (Market-Visio 2013b). Ten years ago offshoring of IT services was still quite low in Finland. Often Finnish companies did not want to hamper their image as a domestic company and the organizational readiness for offshoring had not been achieved yet. However, today Finnish companies have a fairly positive view on offshoring services. In Market-Visio's survey (2013a) 40 % of the respondents<sup>6</sup> took a positive and 37 % took a neutral stand on offshoring. Altogether 59 % of the companies that participated in the survey used IT or business services produced in India. Especially large enterprises (revenue 500 MEUR or more) and companies within finance and

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<sup>6</sup> The target group of the survey consisted of persons who are responsible for IT sourcing or are decision makers regarding IT procurement

insurance field relate most positively to acquiring IT services from an Indian service provider (Market-Visio 2013c).

As mentioned earlier, the application service in the focal company can be delivered from onshore, offshore, or in collaboration of these two. Personnel may be utilized from several offshoring locations. However, this study focuses on deliveries from Finland, India and the combination of these two. There is no clear line between the degrees of offshoring as even an onshore service can utilize some offshore resources and vice versa. That is the case, for example, if cost leverage is needed, if the Finnish unit lacks some specific expertise needed or if the local unit cannot respond to urgent resource needs. The focal company has only a fraction of its global employees in Finland and a third of it in India. Thus, the Indian unit has extensive talent pool which can easily adapt to fluctuations in resource demand. On the other hand Indian resources lack some required knowledge, such as know-how regarding Finnish tax processes. In addition, often some documents need to be translated from Finnish to English. As these content expertise and language skills have to be acquired from Finland, service can hardly ever be fully delivered from India. Figure 3 demonstrates the fluid nature of these three options. It also gives some guidelines when a service is regarded to be onshore, collaboration or offshore delivery in the focal company.

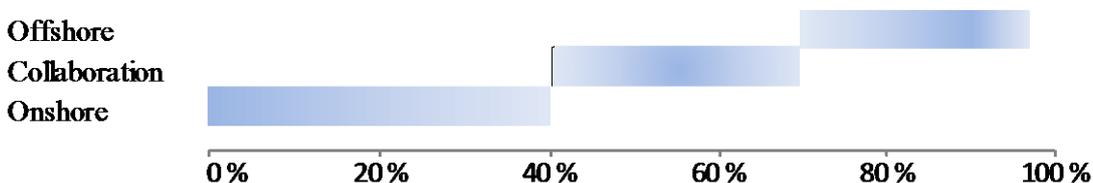


Figure 3 Used offshore leverage in each service delivery model

If the offshore leverage is less than 40 %, the service is regarded as an onshore service. If 40–70 % of the work is performed from India, it is considered to be delivered in collaboration of the two units. If the offshore leverage is more than approximately 70 % it is perceived as an offshore service. This crude division is used later in the data analysis conducted in this study to categorize the data based on the degree of offshoring. In addition to the three delivery models, different governance models can be identified. The governance model depends on whether the delivery responsibility is taken onshore, offshore or whether it is shared between on- and offshore.

The selected delivery model is dependable on several issues. For instance, the size of the service and fluctuations in the incident quantity, the length of the relationship, the level of language skills within the client organization, the intensity of the cost pressure towards the client and whether the client has previous experience on offshoring affect the decision. In addition, at times legislation or regulation forbidding data transfer outside Finnish or EU borders become relevant. Thus, no optimal degree of offshoring can

be found on ‘one size fits all’ basis. Each case has to be evaluated separately and the most suitable option for each client can vary over time as the relationship evolves.

The focal company has already ten years experience in services and projects that have collaborative or offshore deliveries. Yet, a need for more effective collaborative deliveries has been identified. Recently, an internal handbook was written to gather the best practices and lessons learnt in this area. The objective of the handbook is to give recommendations and guideline how to effectively perform services and projects when offshore resources are involved, especially keeping productivity and quality aspects in mind. Thus, it has been recognized in the company as an important topic.

### **3.4 Quality in AMS deliveries**

Most companies in the field have a quality management system (QMS) adhering to international quality standards like ISO 9001 (Dahlberg & Järvinen 1997). Similarly, the focal company has its own QMS that follows international standards, frameworks and industry best practices. The QMS provides process descriptions, role descriptions, tools and templates as well as best practices and sample documents to ensure quality in deliveries. The focal company has internal audits to ensure the correct use of QMS and additionally there are external audits to ensure compliance with the granted certifications.

In global context, the QMS of the focal company’s group is more complicated than within one country. This is because separate entities belonging to the group globally have separate QMSs and separate certificates for the standards. Nevertheless, the QMS of every entity follows the global quality guideline specified by the group. Thus, the QMSs of each unit are aligned and uniform quality is fostered regardless of where the service is produced from. If a service engagement is delivered in collaboration of several entities, the QMS of the entity which owns the contract is followed. Thus, it should be always straightforward which QMS to use in collaborative deliveries. The services covered in the empirical part of this study follow either the Finnish entity’s or Indian entity’s QMS.

Researchers have reminded that QMS is not a “silver bullet”, but only a support tool for quality assurance that can be used correctly or not (Dahlberg & Järvinen 1997). Often employees do not appreciate these systems and fail to comply with the rules (Zelnic, Maletič, Maletič & Gomišček 2012). Resources often feel that QMS offers plethora of documents and templates, but it becomes difficult to understand which one are necessary and how to use them. Unfortunately often the templates are also used just for the sake of compliance rather than for the sake of actually benefitting from the use. Compliance is revealed in audits, but it will not necessary reveal whether enough though had

been given while creating the document. QMS can only provide support tools for quality but it cannot guarantee high quality in delivery.

Another tool for measuring the quality of service is client satisfaction surveys. Client satisfaction is measured regularly in the focal company. At the beginning of the service relationship, the client sets key evaluation criteria for the service and describes what is expected regarding these. The set criteria are reviewed for example yearly. In the client satisfaction survey, the client is asked to evaluate how the focal company has performed in those areas compared with the expectations. After measurement, the changes compared with previous client satisfaction results are analyzed to understand the root causes and be able to take either corrective or confirmative actions.

## 4 SERVICE QUALITY

### 4.1 Introduction to service quality

The research on service quality began in the 1980s and has increased tremendously ever since (see Figure 4, which demonstrates this trend). In the 80s the special characteristics of services, discussed below, were well-documented. Therefore the service quality literature started to emerge as it became acknowledged that comprehension about goods quality is insufficient to understand service quality. Nowadays, service organizations are 1.6 times more likely to view quality as a strategic asset and competitive differentiator when compared with manufacturing companies. (Global state of quality -report 2013) This demonstrates that the importance of service quality has become widely recognized in practice in addition to academia (Lepmets, Cater-Steel, Gacenga & Ras 2012).

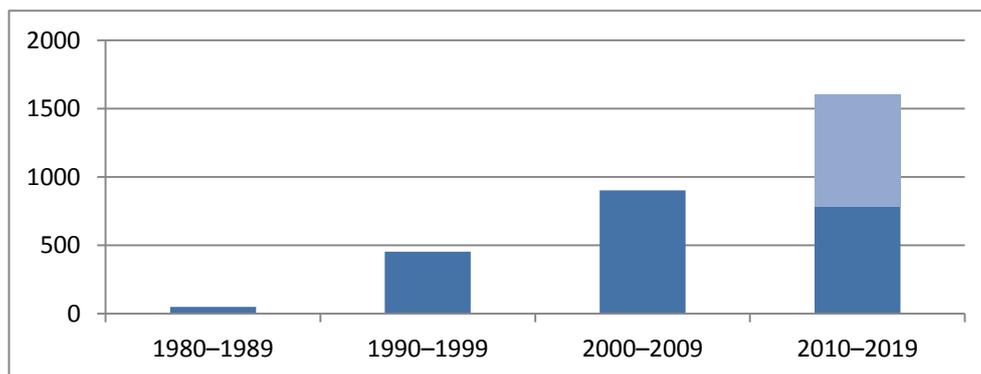


Figure 4 The search<sup>7</sup> results for title "service quality" in scholarly journals.

The special characteristics that differentiate services from goods manufacturing are: intangibility, heterogeneity, and inseparability. Firstly, as most services are intangible they are rather performances than objects, which impede setting manufacturing specifications regarding uniform quality. Secondly, the heterogeneous nature of services signifies that the performance can vary from producer to producer, from customer to customer, and from day to day. The inconsistency makes uniform quality difficult to assure.

<sup>7</sup> The search was conducted on 10<sup>th</sup> of November 2013 from ABI/INFORM Global (ProQuest) business databases for scholarly journals that have "service quality" in the title. Before 1980s there were only a few search results. For 2010-2019 the darker color demonstrates the year-to-date (YTD) figure of publications and the lighter color on top illustrates the estimate for the rest of the time period based on publications per day from the YTD count.

Thirdly, production and consumption of many services are inseparable. The quality often occurs in the delivery of the service in an interaction between the client and the contact person from the service company. Thus, the service company may have less managerial control over quality as the client affects the process. (Parasuraman, Zeithaml & Berry 1985.)

After the initiation of service quality research in the 80s, its popularity as a research topic surged. In the 90s the amount of journal articles conducted was already almost tenfold compared with the decade prior and the strong growth has continued also in the current century as Figure 4 illustrates. At the same time IT outsourcing research had its growth period, whereas offshore studies experienced acceleration only in the 00s (Willcocks, Lacity & Cullen 2006). Despite the service quality literature emerged already over 30 years ago, there is still no consensus regarding its conceptualization or measurement (see, for example, Seth, Deshmukh & Vrat 2004). Service quality is an abstract and elusive construct, making it harder to measure (Lepmets et al. 2012). Thus, despite the prominent role of service industry in modern economies and regardless of the rise of service quality literature, many questions remain unanswered in this field and little consensus has been found for the appropriate service quality measurements.

One area with unanswered question is service quality in B2B market. In the light of previous research, it seems that B2B context is not taken into consideration in the research questions in the extent it deserves. Most of the service quality literature focuses on the consumer market, and as the two markets have tremendous differences, it may not apply to B2B context. These differences include, but do not limit to, differences in buying behavior, the evaluation criteria for appraising alternative suppliers, and the existence of buying centers. Moreover, service quality is a critical concern in the B2B market as it has an impact on the organizational customers' own service to their customers. (Gounaris 2005.) If critical errors are made in the application management service, the IT service provider's customer will face challenges delivering their service to their customers. For instance if creating orders in a grocery chain SAP system does not function and AMS fails to correct the error, the shelves of the grocery stores start to empty, consumers are affected, and the grocery store service quality will be evaluated accordingly by their customers.

Moreover, currently few studies have explicitly researched service quality in offshore software projects. Much of previous research in the field has focused on projects conducted in-house. (Gopal & Koka 2009.) Thus, they position in the top row and more specifically top left corner of Figure 1 illustrating the Outsource/offshore matrix, whereas not much have been published in the bottom row of the figure that captures the scope of this study. Nevertheless, there are significant implications to service quality depending on the positioning in the matrix. First, as explained previously outsourcing signifies operating across organizational boundaries, which reduce the ability of client

managers to directly control the process. Second, offshoring such work face challenges due to factors such as geographical distance, culture and language. (Gopal & Koka 2009.) Moreover, these factors can be expected to have a greater impact on services than on goods as intangible services usually require greater personal interaction between customers and service provider (Mattila 1999; Smith & Reynolds 2002). These two reasons lower the ability of client managers to control quality compared with in-house on-shore IT-services. Indeed, a survey has revealed that the top perceived risks of offshoring are poor service quality, lack of cultural fit and loss of control (Lewin & Peeters 2006).

These observations and the mixed experiences of quality in outsourced offshoring cases, imply that service quality is not necessarily the same in different degrees of offshoring. When studying the offshoring context, in addition to the traditional drivers of quality other may have to be applied. For instance incentive alignment and monitoring may play a larger role in affecting quality. (Gopal & Koka 2009.) For this reason, for example, the SLAs introduced in chapter 3.2, has a great role in practice in determining and monitoring IT service quality. SLAs align incentives through remedies or penalties and rewards. Moreover, they have a key role in monitoring the service.

## 4.2 Conceptualization of service quality

Like mentioned above, the conceptualization of service quality and more precisely its dimensions is another area of open issues and great deal of debate. There are some studies, which see service quality as an individual construct. For instance Dabholkar, Shepherd and Thorpe (2000) take this approach. In their study overall perceived service quality is treated as an individual construct, while factors such as service reliability and personnel attention are regarded as antecedents to perceived quality. Overall service quality is measured through four items<sup>8</sup> on a Likert scale with endpoints strongly agree/ strongly disagree. The merit of this approach is in its simplicity especially for the practitioners. However, the approach has gained some criticism as the items suffer from tautology, which makes it difficult for the respondent to delineate the items apart. Moreover, the analysis of service drawbacks is not possible without evaluating the antecedents. (Gounaris 2005.)

Majority of studies take the traditional approach which acknowledges the multidimensional nature of service quality. However, no consensus has been found on what the

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<sup>8</sup> The items are: “excellent overall service”, “service of a very high quality”, “a high standard of service” and “superior service in every way”

dimensions are. Grönroos, one of the pioneers in identifying the dimensional nature of service quality as well as bringing service quality discussion into B2B context, categorized industrial services already back in 1984 into two dimensions: technical and functional quality. The former encompasses core operation-related aspect of service; what the customer is actually receiving. The latter relates to the way the service is delivered and the interaction between the individuals from both companies. Similarly, according to Kang and Bradley (2002) service factors can be divided into (i) the objective attributes of the service and (ii) the personal attributes of service delivery. In other words, the former ones include the attributes that make up the service offering, such as whether the service is delivered within a reasonable timeframe. The latter one involves the people delivering the service and can be described as the people skills of the IT service provider. These findings are in line with those of Gilbert (2000), who identified two attributes of internal customer satisfaction; one relating to personal service and another to technical competence. All in all, Grönroos, Gilbert, and Kang and Bradley take a similar approach to the conceptualization. They use different names for the dimensions, but in essence they are describing more or less the same attributes; the soft and hard dimensions of service quality.

Some authors have suggested other dimensions for service quality that differ from this dual nature. For instance Brady and Cronin (2001) have suggested that service quality has three dimensions: outcome, interaction and environment quality. Their outcome and interaction quality are close to the hard and soft quality explained above. Environment quality on the other hand relates to the service environment, which is influenced by the ambient conditions, facility design and social factors. The SERVQUAL model, which is represented in more detail in the following chapter, has a tangibles dimension, which includes partly similar items. The SERVQUAL represents all in all five separate dimensions. Berkley and Gupta (1994) introduces a service quality model with seven dimensions: reliability, responsiveness, competence, access, communication, security and understanding the customer. This model has much in common with SERVQUAL.

Philip and Hazlett (1997) model service quality as a hierarchical structure with three overlapping areas: pivotal, core and peripheral. The pivotal attributes are the end products or output from the service encounter. The core attributes are the amalgamation of the people, processes and the service organization structure which consumers must interact and/or negotiate with in order to achieve/ receive the pivotal attributes. Finally, the peripheral attributes are incidental extras that make the service experience a complete delight. The pivotal attributes assimilate to the hard dimension whereas pivotal attributes are similar to the soft. The peripheral attributes introduced by Philip and Hazlett are, however, quite unique as well as the overall structure of the model. When a consumer evaluates a service encounter, she/he is satisfied if the pivotal attributes are achieved, but as the service is used more frequently the core and peripheral attributes

may began to gain importance. See, for example, the literature review conducted by Seth, Deshmukh and Vrat (2004) to gain more knowledge on different service quality models. The authors examined 19 different service quality models reported in the literature.

To summarize, since the pioneer work of Grönroos, several studies have contributed to conceptualize service quality. In the service quality field, oftentimes authors, addressing issues regarding previously developed service quality measures and structures, have suggested new or modified dimensions, rather than confirming the ones suggested in literature previously. As a result, the structure of service quality or an integrated instrument to measure service quality has not been widely accepted and validated by the researchers. However, the literature supports the multidimensional approach to service quality, despite the divergence of the identified dimensions (Gounaris 2005). The following chapter focuses on SERVQUAL mode, which is the most widely used service quality framework. Regardless of its popularity, the framework has encountered substantial criticism. This will be also discussed in the following chapter.

### **4.3 Service quality measurement: SERVQUAL**

Parasuraman, Zeithaml and Berry (1985; 1988) have conducted a widely used scale to measure consumer perceptions of service quality called SERVQUAL. Not only did Parasuraman et al develop a measurement for service quality, but they also advanced the field as the service quality literature has grown tremendously in response to the SERVQUAL measurement. The measurement focuses on the extrinsic measures of service quality and on the way the service is delivered. Parasuraman et al suggest service quality is measured with a customer survey and, thus, it focuses on the customer perception of service quality.

The framework identifies five dimensions, which are reliability, assurance, tangibles, empathy, and responsiveness. The dimensions are measured by 22 items, with each dimension containing four or five items (Table 3). Reliability refers to a company's ability to perform the promised service dependably and accurately. Assurance means the knowledge and courtesy of employees and their ability to inspire trust and confidence. Tangibles are the physical facilities, equipment, and appearance of personnel. Empathy encompasses caring and individualized attention the company provides its customers. Finally, responsiveness concerns the willingness to help customers and provide prompt service. (Parasuraman, Zeithaml & Berry 1985; 1988).

Table 3 SERVQUAL Service quality dimensions and attributes

Service quality dimensions	Service quality attributes
<b>Reliability</b>	Providing service as promised Dependability in handling customers' service problems Performing services right the first time Providing services at the promised time Maintaining error-free records
<b>Assurance</b>	Employees who instill confidence in customers Making customers feel safe in their transaction Employees who are consistently courteous Employees who have the knowledge to answer customer questions
<b>Tangibles</b>	Modern equipment Visually appealing facilities Employees who have a neat, professional appearance Visually appealing materials associated with the service
<b>Empathy</b>	Giving customers individual attention Employees who deal with customers in a caring fashion Having customer's best interest at heart Employees who understand the needs of their customers Convenient business hours
<b>Responsiveness</b>	Keeping customers informed about when services will be performed Prompt service to customers Willingness to help customers Readiness to respond to customer's requests

The model is based on disconfirmation paradigm, which suggests that service quality results from the comparison of expected and perceived performance. Therefore, in SERVQUAL each item from Table 3 is measured according to the actual performance of the service (P) and the expectations for the service (E). The measurement is conducted with a survey where respondents are asked to indicate their agreement with statements on a seven-point Likert scale. The greater the gap score ( $G = P - E$ ), the higher the perceived service quality. Thus, the magnitude and direction of the gap has an impact on service quality. (Parasuraman et al. 1985; 1988) The conceptualization is illustrated in Figure 5.

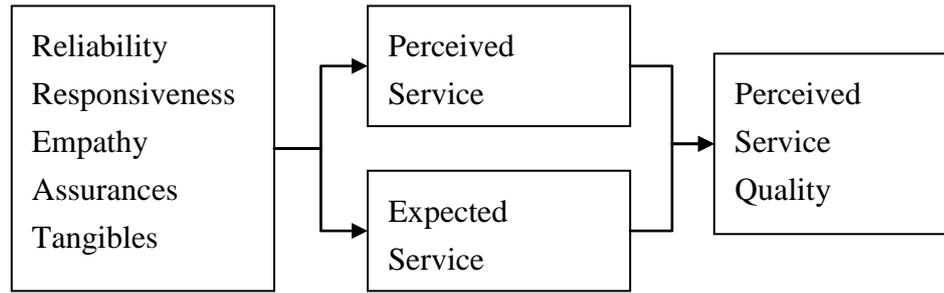


Figure 5 The conceptualization of SERVQUAL model

Interestingly the focal company's approach to client satisfaction survey, which was described in chapter 3.4, relates to the SERVQUAL disconfirmation paradigm. This is because the survey is actually initiated prior to service/ project start (and revised at regular intervals) by asking the client expectations. The performance later is evaluated against the expectations which were raised at the beginning.

Parasuraman et al. (1988) suggests that SERVQUAL provides a basic skeleton, which can be adapted or supplemented to fit the characteristics or specific research needs of a particular sector or organization. There have been several attempts to create a better fit for certain service sectors through adjusting the number of dimensions defined in the original model (Table 3). Nyeck, Morales, Ladhari and Pons (2002) examined 40 articles that used SERVQUAL or a modified SERVQUAL scale to study empirically service quality in a given sector. In these 40 articles altogether 60 sectors were examined. In the vast majority of these observations the number of dimensions used was other than the original five. Thus, the dimensional structure remains very unstable and this applies even within a given sector.

SERVQUAL has been subject to considerable debate regarding its dimensionality, applicability to diverse service sectors and its foundations in the gap approach (Cronin & Taylor 1992; Pitt, Watson & Kavan 1995, Nyeck, et al. 2002). Nevertheless, SERVQUAL has become the most accepted and most widely used conceptualization of service quality (Pitt et al. 1995; Nyeck et al. Pons 2002; Lepmets et al. 2012). The strengths of the scale have been seen in its applicability across a broad spectrum of services and its ease of use (Parasuraman et al. 1988; Nyeck et al. 2002). For example, SERVQUAL has been confirmed by some researchers to be an appropriate instrument within the IT service quality context (Pitt et al. 1995; Kang & Bradley 2002) and in the consulting industry (Aldhizer, Turner & Shank 2002; Casadesús, Viadiu, Saizarbitoria 2002). However, the industry-specific studies have often resulted in controversial outcomes. For example another study in the IT service field provided mixed results (Badri, Abdulla & Al-Madani 2005). The scale was initially developed within consumer market and its applicability in the business-to-business environment remains debated as several

studies have confirmed applicability (see for example Aldhizer et al. 2002; Casadesús et al. 2002; Donnelly, Hull & Will 2000) and at the same time several studies have criticized its applicability in the B2B context (see for example Gounaris 2005; Benazić & Došen 2012).

#### **4.4 Service quality measurement in B2B context**

Most of the current research has focused on measuring service quality using the SERVQUAL scale or some variation of it (Gounaris 2005). Research has, however, increasingly found that SERVQUAL scale being developed for consumer services has shortcomings in certain areas (Ladhari 2008). The consumer and industrial services are different in many aspects. First of all, B2B service relationships are typically longer-term and greater-intensity in nature, which implies different service factors to those pertinent to individual consumers (Lee 2011). Moreover, typically consumers are offered standard services whereas organizations actually purchase frequently customer-specific and unique solution to a specific problem. For example AMS in SAP is always customer-specific in a sense that customers have different versions, enhancement packages and industry solutions of SAP in use, their SAP is customized into certain extent, and different customers prefer divergent solutions. The B2B services are also often technically complex and sophisticated, which make them increasingly difficult for customers to evaluate (Patterson, Johnson & Spreng 1997).

Thus, there have been several attempts recently to investigate and develop alternative B2B-specific scale, which has been a necessary and important advancement. INDSERV, proposed and developed by Gounaris (2005) has been argued to be the most important contribution in this area. (Lee 2011.) INDSERV was developed based on previous research related to B2B industry. Some empirical tests suggest that INDSERV fits the B2B market better than SERVQUAL. INDSERV exhibited predictive, convergent and discriminant validity as well as internal consistency. (Gounaris 2005.)

INDSERV suggests that industrial customers base their evaluation of perceived service quality on their assessment of four corresponding sub-dimensions:

1. potential quality,
2. hard quality,
3. soft quality, and
4. output quality.

The combination of these dimensions constitutes customer's overall perception of the quality of service (Figure 6).

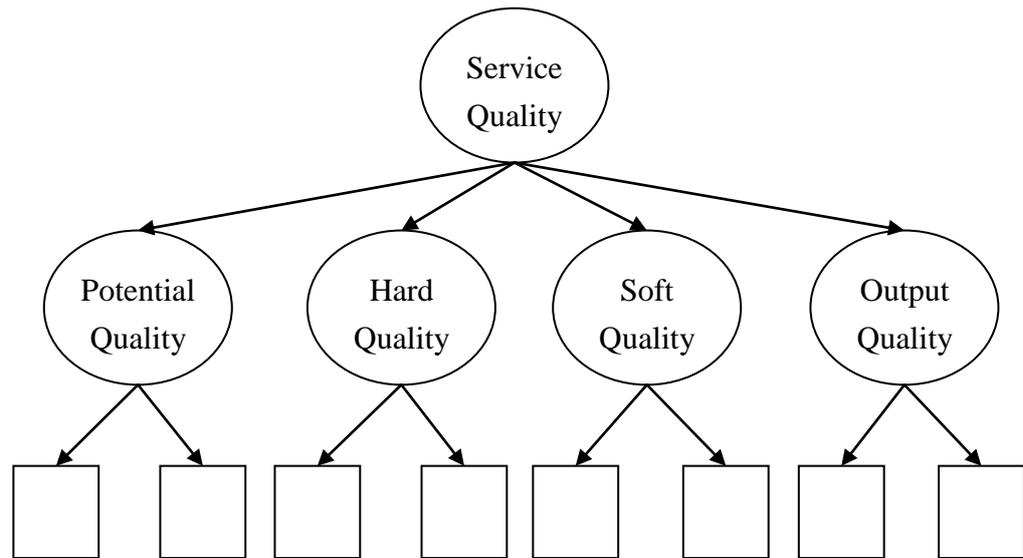


Figure 6 Gounaris second order latent model

Potential quality relates to the search attributes customers use in order to evaluate the provider's ability to perform the service before the relation has actually began. It covers elements such as adequate staffing, facilities and management philosophy that are required in order for the supplier to provide the service. Hard quality pertains what is being performed during the service process whereas soft quality pertains how the service is performed. Hard quality includes objective and task-oriented issues such as staying within schedule and budget. Soft quality refers to communication and relational issues such as politeness and way of listening to the client. These two dimensions were discussed already earlier as several researchers have identified them. Finally, output quality captures the results of the technical efforts to deliver the service as well as the impact that the service delivered eventually produces for the client. It covers the impact the supplier's services have on, for instance, client profitability and ability to operate.

Similarly to SERVQUAL, INDSERV has received some criticism regarding the dimensions. Lee (2011) argues that instead of treating the four dimensions as indicators of a single latent "B2B service quality" factor, they should be modeled as a process where potential quality is the antecedent of hard and soft quality, and these three dimensions are the antecedent of output quality. Moreover, the soft and hard quality dimensions of INDERV are similar to the dimensions identified by other authors in the consumer market (see chapter 4.1). Based on the differences in the industries' natures one could expect divergent dimensions. Nevertheless, the evaluation made within each dimension may differ in consumer and business contexts. Moreover, the other two dimensions in INDSERV are not identified, at least commonly, in the consumer market.

## 4.5 Service quality measurement in IT service context

There has been criticism regarding the use of generic service quality measurement frameworks, such as SERVQUAL or INDSERV, and questions have been raised whether alternative industry-specific measures should be developed for specific service settings (Ladhari 2008). However, the IT service field has been mainly unheeded. For instance, Ladhari (2008) analyzed 30 studies that discussed service quality from an industry-specific point of view and the sample did not cover any studies from the IT service industry. Similarly, Gopal and Koka (2009) argue that there is little work focusing on service quality in offshore software development outsourcing.

Much of previous research concerns in-house projects which differ from outsourced IT services. Moreover, prior research has adapted a production-based approach to software development that uses the number of defects as quality indicator. However, Gopal and Koka (2009) argue that defects rate provides an inadequate and often misleading assessment of quality. First of all, software development projects involve software services and other value-added activities that are not necessarily captured in code. This is often the case in AMS provided by the focal company as development in SAP commonly include configuration done by functional consultants in addition to/ instead of ABAP coding done by programmers. Configuration or, for instance, service management cannot be evaluated with defect rates. Secondly, defect rate may be misread as it does not necessarily imply that programming has poor quality. It may be also due to inadequate requirements analysis and specification. Thirdly, broader measures of quality, such as ease of use, functionality, reliability, robustness, and cost of its operations, are needed. (Gopal & Koka 2009.)

Lepmets et al. (2011; 2012) have contributed in the IT service specific service quality context. The purpose of their research was to identify IT service quality attributes that could be measured to improve IT service quality. They argue that service quality is something agreed between the service provider and its customer. Thus, even though their approach is not based on the disconfirmation paradigm which Parasuraman et al. rely on, they recognize that the expectations, mutual understanding and/or contractual agreement set before the service initiation have an impact on what is considered as good service quality. Despite justifying service quality as something agreed case by case, Lepmets et al. (2011) argue that some commonly accepted service quality attributes can be identified. They used previous research, industry best practices as well as international standards to derive the attributes of IT services. They argue that commonly accepted IT service quality attributes include:

- Availability: Information system is available to users at agreed time and place
- Capacity: The power to store and process data, and absorb changes in the required time

- Performance: Speed of information processing
- Security: Information is available to those who have the rights (confidentiality), information is complete, protected and accurate (integrity), and information is available and usable when the customer requires it (accessibility)
- Scalability: Service provider's ability to ensure growth at the required speed without disturbing the business
- Adjustability: The development method, architecture and infrastructure that can support adjustments according to the needs of the customer organization
- Portability: The system's compliance with the standards

Lepmets et al. adapted two widely known quality measurement frameworks of software engineering to IT services and applied them to the identified commonly accepted quality attributes listed above. More specifically, they utilized SERVQUAL in addition to ITIL and ISO 20000 (see Appendix 1 for more information on ITIL and ISO 20000) with the support from extensive literature review. As a result, they developed an IT service quality measurement framework, which constitutes out of six common issue areas. The identified common issue areas are IT service value, Information System (IS) quality, IT service quality, IT service processes' performance, customer satisfaction, and service behavior. Each common issue area has associated measurement categories, measures, and indicators which are presented in Appendix 2. All other common issue areas relate to intrinsic attributes, except customer satisfaction, which reflects the customer experiences and, thus, extrinsic attributes.

The major difference between SERVQUAL and Lepmets et al. approaches is that SERVQUAL puts emphasis on the service provider's attitude and empathy, and addresses how that directly influences the overall customer satisfaction (Lepmets et al. 2011). Thus, SERVQUAL model is based on functional quality (the delivery process) (Ladhari 2008), whereas the framework proposed by Lepmets et al. focus mainly on technical quality (the outcome of the service encounter). The common issue area 'customer satisfaction' is influenced by SERVQUAL and accordingly is very similar to it. However, the other issue areas take a very different approach to measuring service quality. The dimensions of INDSERV take both, functional and technical quality, into account. The measurement in SERVQUAL and INDSERV is conducted with customer surveys whereas Lepmets et al. propose a more complex combination of measures including data analysis from the incident management system, audit results, financial figures, and customer surveys.

Gopal and Koka (2009) have also done research in the field. Their findings indicate four items affect service quality: requirements uncertainty, trained personnel, client level of experience, and contract type. Requirements uncertainty and lack of trained personnel lower the quality provided by the vendor. Client experience affects service quality in a way that more experienced clients are able to manage the risks inherent in off-

shore development better as they are able to establish appropriate control mechanisms, create suitable incentives for vendor team, and manage the development risk. Moreover, the findings suggest that fixed price (FP) contracts are more likely to deliver higher quality than time and materials (T&M) contracts. FP contract means the fixed price for the work is agreed in advance and the vendor bears the risk of overruns in the work effort and schedule. T&M, on the other hand, are cost plus contracts where the service is bought at a specified billing rate

Gopal and Koka (2009) argue that, due to the different incentive and risk structure of FP and T&M contracts, the vendor manager is more likely to staff FP engagements first with the most appropriate skilled personnel, which lead to higher quality. There is, however, no indication that this would be the case in the focal company. This is perhaps because most of the service engagements actually are mixed contract types: certain activities are included in FP part of the contract and additional tasks are billed separately on T&M basis. In addition, more experienced personnel also have typically higher salary, resulting in lower profits. Because of this, the service provider often tries to structure deliveries so that the effort of more and less experienced resources is balanced. Moreover, as the relationships to the clients are long lasting, short-term optimizing of the service provider's own profit and risk may not be beneficial in the long run. Thus, the incentive to treat the contract types differently disappears.

## 4.6 Quality assurance in IT service field

The quality of IT services is a matter of information technology service management. IT service management, or ITSM, is defined by itSMF<sup>9</sup> and Best Management Practice as “a set of specialized organizational capabilities for providing value to customers in the form of services”. These specialized organizational capabilities include all the processes, methods, functions, roles and activities that a service provider uses in service delivery. (itSMF ITIL V3 2007.) Contrary to the traditional technology-orientated approaches to IT, IT service management is a discipline for managing IT operations as a service. It focuses on IT operations such as service delivery and support. IT service providers cannot afford to focus on technology and their internal organization, they now have to consider the quality of their service and focus on the customer relationship. (Galup, Dattero, Quan & Conger 2009.) It is argued that adopting good practice can help the IT service provider to create an effective service management system. This good practice

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<sup>9</sup> The IT Service Management Forum (itSMF) is a non-profit organization that develops and promotes IT Service Management best practice independently from any IT service providers (itSMF International).

can come from various sources, including public frameworks (such as ITIL and CMMI), standards (such as ISO/IEC 20000 and ISO 9000), and proprietary knowledge of people and organizations. (itSMF ITIL V3 2007.)

These frameworks and standards have an important role in the IT service industry. They are used as quality references around the globe to ensure internal practices foster quality and to prove the quality of the services to clients in form of certifications. There are many case examples in the industry to testify the value of incorporating a standardized approach to IT services (Galup et al. 2009). However, as it is not necessary to understand the details of these frameworks and standards and their differences to follow this study, they are introduced in Appendix 1 for further reference. It covers the introduction for following frameworks and standards:

- ITIL – The Information Technology Infrastructure Library: A set of best practices in IT service management
- ISO/IEC 20000 Information technology service management: A standard for IT service management
- ISO 9001 Quality management system, requirements: A standard for quality management systems
- CMMI – Capability Maturity Model Integration: A process improvement/ maturity model

To derive measurable attributes of IT service quality, Lepmets et al. (2011; 2012) used IT service management literature, including for instance the IT service management process described in ISO/IEC 20000 and other related standards. Also other researchers have justified the use of international standards and frameworks in quality determination. For instance, Parzinger and Nath (2000) found that CMM level and extent of compliance with ISO 9000 have a significant positive relationship with software quality. These standardized processes, and the certifications quantifying them, refer mostly to the previously explained intrinsic quality of a service. In other words, it describes what is offered and how it is managed.

In early 1990s ISO 9000 became more or less mandatory for companies seeking to sell various products and services, including software products and IT services, in the European Community (Jones 1994). The use of international standards promotes high quality in IT services globally and the 1990s became, indeed, the first decade of software's true globalization (Carmel & Tjia2009). The use of standardized processes has become one key determinant of quality in the IT service field. The global state of quality -report (2013) claims that the frameworks and standardized processes for quality management can improve the efficiency of assessing adaptation as well as improve compliance to quality principles throughout the organization. However, the existence of frameworks or standardized processes does not guarantee success. Certifications provide some concrete evidence of service quality, which otherwise is such an elusive and

abstract concept, to the service provider's clients. Moreover, they are used globally and regarded to be objective, which gives credibility to the service provider everywhere in the world.

A comparison of a few industry players reveals that they rely heavily on certifications when assuring their service quality. The comparison included Accenture, Capgemini, CGI, Fujitsu, IBM Consulting, Infosys, Tata Consulting Services (TCS) and Wipro, all of which have a remarkable role within the global and Finnish IT consultancy market. All of the companies referred to CMMI and/or ISO certificates (see Appendix 3) when assuring a high level of service quality. Research has also identified that especially large organizations look towards certifications for quality assurance (Hirschheim & Dibbern 2009). The European and American based companies also mentioned client satisfaction as one of the quality measures. In addition, they described the quality assurance in more detail than their Indian counterparts, which had quite brief presentations of quality on their websites and, hence, seemed to rely even more heavily on the achieved certificates as quality assurance. Indian companies are more eager to achieve certificates than their Western counterparts (CMMI Maturity profile report 2013), which may expound the difference. In general, IT services are argued to be especially complex for the customer to evaluate (Benazić & Došen 2012), which may be the reason why companies in the industry do not rely much on customer surveys in quality assurance, even though it is the most used method to determine service quality in academic studies.

In the industry, higher CMMI level is regarded as the best option. However, some research claims that the relationship may struggle if the client is not on the same level of maturity in processes. If the client is operating at a low maturity level, the supplier may have to help the client to improve their processes, or be flexible by finding ways to fit into the client's process. (Rottman & Lacity 2009.) Therefore, as the Finnish organizations are quite reluctant to obtain certifications (Global state of quality -report 2013), lower CMMI levels of IT service providers may actually create better fit for them and their clients. Moreover, whereas service providers believe CMMI and other certificates signal quality, clients believe they are indications of quality *potential* (Lacity & Rottman 2008, 122)

To summarize, the service quality research started to emerge already decades ago, but there is still no consensus on suitable measurement frameworks. Moreover, even the structure and dimensions of service quality have not reached maturity. SERVQUAL is the most used framework in literature, but at the same time it has faced substantial criticism. In response to the criticism related to SERVQUAL's applicability to B2B industry, INDSERV was introduced. However, INDSERV has not yet reached an established position as a measurement framework. Similarly, dozens other alternative measures have been introduced, but none of them have gained ground. The service quality literature remains fragmented and the measurements introduced have not been adopted in

practice. There have also been some attempts to bring service quality measurement into industry specific contexts. For instance Leptmets et al. have proposed a measurement framework for the IT service industry. Their framework is, however, very complex, which may hinder practitioners and other researchers adapting it. As presented above, IT service providers rely in practice heavily on international standards when assuring high quality and customer satisfaction surveys to measure realized quality.

## 5 DATA AND METHODOLOGY

### 5.1 Methodological approach

Methodology is the product of philosophy whereas the sciences are the realization of their methodology (Hindess 1977, 4). All research is based on some underlying assumptions and to make these visible, next the philosophical approaches and selected methods are presented. It is important to understand the methodological choices and their assumptions regarding ontology and epistemology. Ontology is the study of existence and epistemology is the study of knowledge. The philosophical approach of this study relies in critical realism.

Critical realism, as a form of realism, has realist ontology arguing that there is an existing, causally efficacious, world independent of our knowledge. The world would exist whether or not human did. (Mingers, Mutch & Willcocks 2013.) Walker, Johnson and Leonard (2006) propose based on previous research that distinction can be made between subjectively perceived and objective quality. Objective quality is embedded in what is offered and can be shown to be comparatively superior with reference to some ideal standard. In other words, quality may be said to be intrinsic to an object, as well as an extrinsic attribution. This view is reflected, at least to some extent, in the work of those who divide service quality into functional and technical quality or other similar dimensions, such as Grönroos, Kang & Bradley, and Gilbert discussed previously. Critical realism supports this notion that there is an objective service quality, which is independent of individuals perceiving it.

However, critical realism recognizes that our access to this world of truth is limited and always mediated by our perceptual theoretical lenses (Mingers, Mutch & Willcocks 2013). Thus, on epistemological perspective it recognizes the relevance of human subjectivity. The subjectivity is well noticed, for instance, in the client satisfaction surveys that the focal company conducts. One can notice that certain clients are consistently more generous with their evaluations while others are more moderate. Factors such as organizational culture affect the perception of respondents. In addition, there may be underlying governing purposes that direct the answers. For example, some clients are reluctant to give very good feedback as they are afraid the service becomes stagnated. In these cases the survey results does not necessarily reflect the true subjective perceptions of quality, but rather it is hidden. Moreover, dispersion can be observed also in the results within same client organizations (evaluating same service), and not just across different client organizations (evaluating different services). Human subjectivity has a role in the interpretations of service quality that individuals have constructed.

Critical realism does not see truth as something that is simple, transparent and easily observed or evaluated. People look at the world through their lenses and they may interpret truth differently. The positioning of critical realism in respect to other research approaches is illustrated in Figure 7.

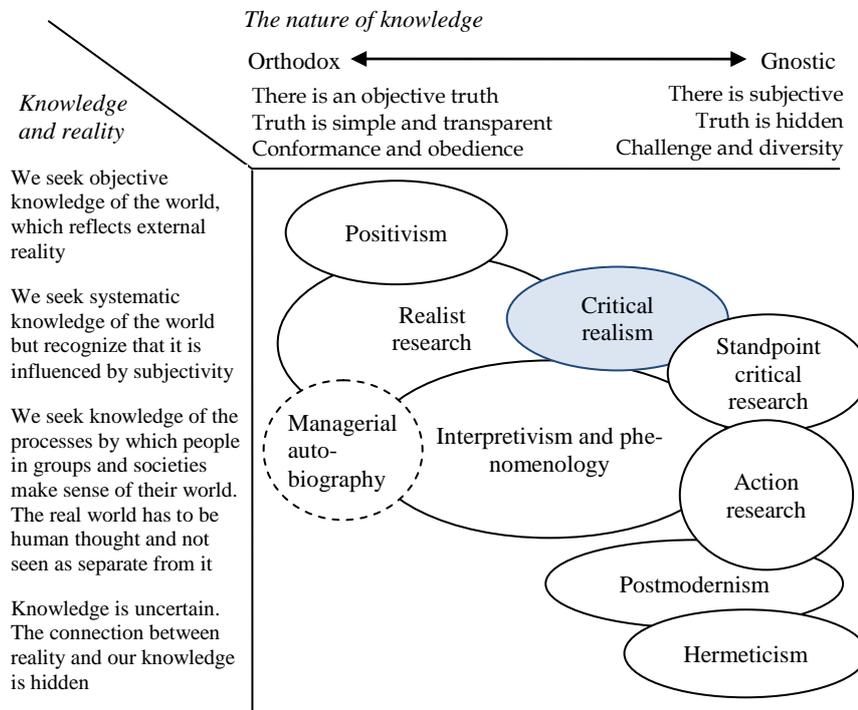


Figure 7 Research approaches (adapted from Fisher (2010; 17))

Similarly to critical realism, realist research refers to ontological realist and subjective epistemology. However, they see the truth more simple and transparent than critical realists do. Critical realists argue that there is a level of reality that is not easily accessible because it is hidden from common view. (Fisher 2010.) That being said, this study does not pursue all-encompassing description of service quality in different degrees of offshoring. However, it contributes to understanding the issue better and invites others to continue the research to together build a more comprehensive apprehension. Critical realism takes a more gnostic view and, thus, it is not horizontally positioned on the same area as realist research in Figure 7. It accepts the existence of different types of objects of knowledge, for example physical, social, and conceptual. Different research methods give insight to different objects. To access all of them, multiple research methods are needed. (Minger et al. 2013.) This is one of the reasons why mixed-methods were selected for this study.

Fisher (2010) argues that critical realist research in business and management has the ability to discover issues that ought to be made known and have corrective actions. It shifts attention towards the real problems that we face and their underlying causes (Minger et al. 2013). Thus, it is relevant in the quest to understand the quality issues in

each degree of offshoring better. When these are identified, corrective actions can be performed to enhance the service delivery processes.

## **5.2 Research design**

As the research topic is not well examined before, the study is exploratory in nature and no priori hypotheses were defined. To be more specific, exploratory case study is utilized and it focuses on the focal company that has been introduced in Chapter 3.1. Case study research involves gathering data from a variety of sources and methods within a specific setting. The case can be for instance a person, program or, like in this study, a company. Case study research suits well to broad research questions (Cousin 2009, 131–132). Moreover, the method allows building holistic and meaningful characteristics of real-life events (Yin 2003, 2). Adelman et al. (1980, 59) have described that researchers selecting case study as a research approach, “recognize the complexity and ‘embeddedness of social truths’”. This was also highlighted in previous chapter where the underlying methodological assumptions were expressed.

First the research objective and questions were identified, following by the selection of methods and data that provide meaningful analysis for the study. Then, the data analysis techniques were selected and the criteria for interpreting the findings. The empirical research of this study is conducted as a mixed-method research. These are executed sequentially so the research objectives and questions are revised prior to the second (qualitative) phase based on the findings from the first (quantitative) phase. The overall research design is illustrated below in Figure 8 and explained carefully in the following paragraphs.

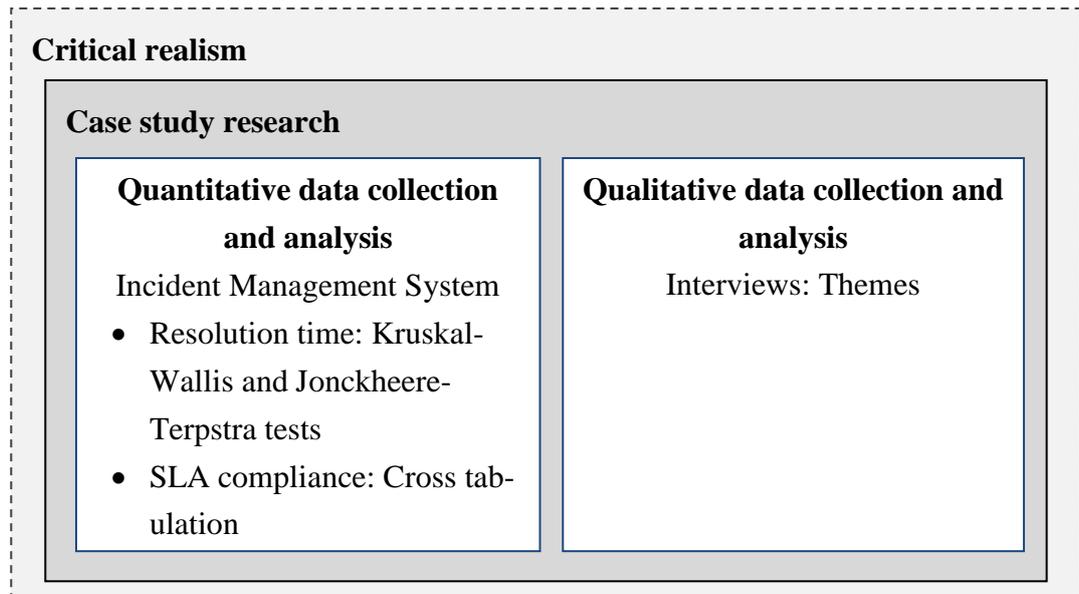


Figure 8 The research design

The extrinsic attributes of service quality have been studied in previous literature in more detail, especially thanks to SERQUAL and various applications derived from it. However, little is said about intrinsic attributes of service quality. (Lepmets et al. 2012.) Therefore one of the objectives of this study is to shed light into intrinsic or objective service quality. The author believes that quantitative method, which is not directly affected by the perceptual lenses of individuals, is the most suitable for observing the objective attributes. Thus, quantitative analysis was selected as the primary method of the study. Moreover, as surveys are the most used method in the field and as the author believes the survey replies are also affected by the perceptual lenses of individuals, it was excluded from the alternatives for research method. After this decision, the available data and quantitative methods were evaluated.

Lepmets et al. (2011; 2012) outlay multiple data sources for intrinsic quality research in IT service context (see Appendix 2). However, there are several problems with utilizing these. First of all, the quality indicators have not been validated yet by other researchers. Moreover, some of the indicators require clarification. For instance one indicator that Lepmets et al. proposes is client revenue growth that signals co-value creation. However, it has not been determined how other factors affecting the revenue growth are controlled. Similarly using non-value added activities or system complexity as an indicator requires more details, such as how these concepts are determined and, consequently, measured. On the other hand, some indicators were precise, but the required data is not systematically gathered in the focal company and, thus, could not be used in this study. For instance, incidents are not recorded on a level that incidents re-

lated to the specific areas suggested by Lepmets et al. could be analyzed. These included, for example, incidents related to IT service capacity or IT service performance.

After analyzing thoroughly what data is available for the study and suit the purpose of the study, the data extracted from Incident Management System, was decided to be utilized. Incidents are the primary unit of the service and as they are recorded in a system, it provides measurable and meaningful data for the analysis. The data from client satisfaction surveys was also considered, but it was decided to be neglected for several reasons. First of all, the study would not add much value to previous research as they have used similar data and methods. Second of all, the surveys would not help to understand intrinsic quality so it does not provide a good fit to the objectives of the study. Third of all, the data would be problematic to evaluate with statistical tests as all the customer satisfaction surveys conducted at the focal company are different. As explained previously, the client decides the evaluation criteria at the beginning of the service (and they are revised for example yearly), and these items are then asked at the survey. Thus, each customer survey has different items. Finally, prior research has concluded that customer satisfaction and quality are two distinct though related constructs. There is still no consensus on how exactly the concepts are linked to each other. (Gopal & Koka 2009.)

To provide a more comprehensive view to service quality and to complement the findings from the quantitative analysis, additionally interviews were decided to be conducted. As interviews provide access to truth seen through the lenses of the interviewees (and the interviewer), they may also give fruitful insight to the perceived service quality. To concentrate on intrinsic quality and to add more value to previous research, which has focused on client perspective, the interviewees were selected from the IT service provider's organization. The Incident Management System provides very fruitful data but only in very limited area. Interviews provide access to topics which are not covered in the recorded incidents and/ or cannot be measured from them. Mixed-method, where quantitative and qualitative methods complete each other, enables more robust analysis. The methodological triangulation ensures the reliability of the case study (Cousin 2009, 136).

Typically exploratory studies follow a design where qualitative study is performed first and based on the results, the researcher tests or generalizes in quantitative phase the initial findings (Ivankova, Cresswell & Stick 2011). This study will also use sequential timing. However, in contrary to the sequence explained above, the quantitative phase is conducted first followed by the qualitative phase. Moreover, in the typical exploratory mixed-method study, the quantitative and qualitative phases examine the same research objects. That does not hold true in this study as the quantitative analysis focuses strictly on the delivery times of the service whereas interviews cover broader spectrum of topics. Nevertheless, the findings from quantitative analysis can be utilized when selecting

the interviewees for the second phase as well as to direct the interview topics. For this reason, the sequential design was selected.

Some researchers have argued that it is impossible to mix qualitative and quantitative methods due to incompatibility in the paradigms underlying the methods (Burrell & Morgan 1979, 25). However, other researchers argue that qualitative and quantitative data usually complement each other and combining these data types can be highly synergistic (Eisenhardt 1989; Humerinta-Peltomäki & Nummela 2004). In this study, the same research questions are not attempted to be examined from the different perspectives with the quantitative and qualitative data. Both of the methods will be used to study intrinsic quality, but focusing on different, complementing sub-topics. The quantitative method is used for analysis restricting to incident resolution times and to achievement of SLAs from objective point of view. The qualitative interview data will be collected to understand service quality in a broader context. The qualitative method will shed light to the personal experiences and believes regarding service quality.

The philosophical backgrounds of both employed research methods are respected and both methods serve a specific, complementary purpose. The qualitative and quantitative researches provide different perspectives and each has its limitations. The limitation of one method can be offset by the other method and, thus, the combination of qualitative and quantitative data provide a more comprehensive understanding of the research problem than either approach by itself. Nevertheless, also mixed-methods have challenges: it requires more time and resources compared with conducting only quantitative or qualitative research. (Creswel & Clark 2011, 8.)

### **5.3 Data collection**

As described in previous chapter, the data extracted from the Incident Management System was selected for the analysis. This data enables studying intrinsic service quality objectively. The terms Incidents and Incident Management System have been introduced already in chapter 3.2. The preliminary analysis of the data revealed that some values in the system are not used in a consistent way within different country units and/or across different clients' incidents. For example there seem to be differences in categorizing the incident type. If this was used in consistent manner, an analysis on what kind of incidents is handled onshore and what kind offshore would have been interesting. Unfortunately the data did not enable this analysis. Two areas were selected for further analysis:

- Resolution time, i.e. the time spent from submitting to resolving the incident

- SLA compliance (which was also introduced in chapter 3.2), i.e. whether the agreed service level has been met or missed. Both, the SLA for reacting and SLA for resolving, are analyzed.

Resolution time is a key metric in AMS quality that has been recognized also in previous research. For instance Lepmets et al. (2011; 2012) have recognized “mean time to achieve incident resolution” as an IT service quality indicator. On the other hand, SLAs are claimed to be at the heart of managing a successful IT outsourcing relationship (Goo 2009). If incidents are resolved quickly, they also meet the SLA times. Thus, SLA compliance is expected to go hand in hand with the results from resolution times. However, SLA analysis takes into account that some incidents are not as urgent as others. On the other hand, the client appreciates handling all incidents as soon as possible. For these reasons, both indicators are analyzed in this study. The goal of the focal company Incident Management is to handle incidents as quickly as possible and, thus, to ensure that the best possible levels of service quality and availability are maintained. This is also aligned with ITIL and industry best practices.

As explained previously, there is no consensus on the dimensions or indicators of quality. If compared to previous research, the metrics utilized here would fall into the technical quality proposed by Grönroos, objective quality attributes discussed by Kang and Bradley, responsiveness dimension of SERVQUAL (see Table 3), hard quality in INDSERV, and IT service quality common issue area suggested by Lepmets et al. and more specifically to the IT service reliability category (see Table 10 from Appendix 2).

The data includes incidents that have been active in the Incident Management System during the period of 1/5/2012 – 31/3/2014. The focal company had extracted the data from the Incident Management System on monthly basis to Microsoft Excel for reporting purposes. The data for the above mentioned 23 months was provided by the focal company for the analysis. After that, some preliminary modifications were made. The monthly data was merged into one file, and as some incidents were included in the data of several months, duplicates were removed in a way that only the most recent record of the incident was kept. Only incidents which had statuses resolved and closed were examined as they have data regarding the resolution time and whether SLA for resolving the incident was met. In addition, some incidents included invalid or missing data in the submit date/ time or resolution date/ time information and, thus, had to be eliminated. All in all, after these eliminations, the data consists of 29 986 incidents. This data was used for the resolution time analysis as well as to analyze whether SLA for resolution was met. For analysis whether SLA for reacting to an incident was met, additional 3 509 incidents had to be removed because the response date/ time information was missing.

The service engagements were grouped into three delivery mode categories: onshore, collaboration and offshore. The data constitutes of 14 service engagements. First each

incident was assigned to onshore or offshore based on which country it was assigned to. Then each service engagement was assigned to a delivery mode based on what percentage of incidents was resolved on- and offshore. To determine the delivery mode, the reference values from Figure 3 for the degrees of offshoring were adapted. The results of the categorization can be found below from Table 4.

Table 4 Delivery modes of the services from empirical data

Service No.	Onshore	Offshore	Delivery mode
Service1	100,00 %	0,00 %	Onshore
Service2	99,92 %	0,08 %	Onshore
Service3	99,85 %	0,15 %	Onshore
Service4	99,77 %	0,23 %	Onshore
Service5	98,16 %	1,84 %	Onshore
Service6	94,83 %	5,17 %	Onshore
Service7	92,55 %	7,45 %	Onshore
Service8	76,75 %	23,25 %	Onshore
Service9	57,41 %	42,59 %	Collaboration
Service10	4,10 %	95,90 %	Offshore
Service11	2,91 %	97,09 %	Offshore
Service12	0,42 %	99,58 %	Offshore
Service13	0,17 %	99,83 %	Offshore
Service14	0,17 %	99,83 %	Offshore

The data surprisingly revealed that there was only one service that fits the collaboration delivery mode category. Only one other service came anywhere near the reference value for collaborative delivery. The pure forms of onshore and offshore deliveries were also extremely unusual as only one service was delivered purely onshore and none were delivered purely offshore. All other services were heavily delivered on- or offshore but not fully (92.55 – 99.95 %). All in all, out of the 14 service engagements eight were delivered onshore, five offshore and one was delivered in collaboration. After the above mentioned modifications to the data were performed, it was uploaded to IBM SPSS Statistics, which is the software used for statistical analysis.

The author acknowledges that the data from Incident Management System provides a very limited analysis on service quality. Moreover, only a portion of the data stored in the system is possible to be utilized in this study. For instance also the emails sent between consultants and clients are saved in the system. These could provide a very extensive and fruitful data for analyzing, for example, the tone and way of communicating with the client, the proactiveness of consultants and reasons behind protracted resolution times. However, the system does not support analyzing this data with any tools.

First each incident would have to be manually searched and opened from the system and then each message saved in the incident details would have to be separately opened and analyzed.

Thus, to overcome the fact that the incident data provides only a very limited analysis on service quality and to diversify the analysis, interviews were selected for second data source. To be able to utilize the results from the quantitative analysis, the interviews were scheduled after it was finished. To further examine the intrinsic quality of service, all interviewees were selected from the service provider organization. Moreover, they were selected from different organizational positions in order to not become restricted by their homogenous perceptual lenses. To be more precise the interviewees covered the following roles: quality lead, service manager, change manager and consultant. The qualitative data was gathered through face-to-face semi-structured interviews between October 2014 and March 2015 in the premises of the focal company. More details of the interviews can be found from Table 5 below.

Table 5 Interviews

Role	Interview date	Duration
<b>Quality lead</b>	15.10.2014	82 min
<b>Service manager</b>	17.03.2015	48 min
<b>Change manager</b>	30.03.2015	57 min
<b>Consultant</b>	24.02.2015	39 min

Saaranen-Kauppinen and Puusniekka (2006) argue that the interviewees should not be selected randomly for semi-structured interviews. Rather, selection should involve individuals who are the most likely to give input regarding the matter of interest. Thus, each interviewee was selected carefully. The objective was to interview divergent persons based on their role, years of experience in the industry and their primary delivery model. More information on these categories is given for each interviewee below in Table 6 and in the following paragraphs.

Table 6 Interviewees

		Quality lead	Service manager	Change manager	Consultant
<b>Experience</b>	Junior			x	x
	Senior	x	x		
<b>Primary delivery model</b>	Onshore		x		x
	Collaboration	(x)	x		
	Offshore			x	

In addition to the interviewees listed above, another service manager was invited to an interview, but she declined the invitation because she had just resigned. Due to the resignation, she was occupied with knowledge transfer during her notice period. Moreover, discussing any internal company issues was perhaps not that interesting to her anymore. All other interviewees accepted the invitation to the interview. The willingness to participate in the interview was first asked face-to-face from the interviewee and then electronic calendar invitation was sent.

The responsibilities of the quality lead include, among others, conducting internal quality audits, writing reports from them and tracking that the agreed improvements are implemented. Moreover, the development of the QMS is on their responsibility. This includes developing the templates and tools according to, for instance, the feedback received from the users or changes made in standards. In addition, the quality team supports the consultants in any issues related to quality and QMS. As the quality team is not part of the delivery organization, the interviewee did not have a primary delivery model at the moment. She has, however, worked in the industry for almost two decades. During that time she has been working in different kind of deliveries for instance in service manager role in infrastructure service. She had strong experience on working in collaboration with the offshore colleagues.

The service manager has overall accountability for the service he is managing. He ensures all service support and delivery actions meet the client's business needs and IT requirements. The service manager is also responsible for overall customer satisfaction. The role includes a lot of coordination and communication tasks within the focal company's own organization and towards client organization. Service managers review the service KPIs (including SLA) and oversee processes to ensure quality is maintained. The interviewed service manager is responsible for Service8 from Table 4, which is delivered 76.75 % from onshore (23.25 % offshore). Based on the definition introduced in chapter 3.3, this is defined as an onshore service. The interviewed service manager works very closely with the service manager of Service9, because the clients of these services belong to the same corporate group. In case the service manager of Service9 is absent, the interviewed service manager substitutes her. Service9 is delivered 57.41 % onshore (42.59 % offshore) and is, thus, determined as collaboration delivery. The interviewed service manager has been in current position for about five years and before that he has worked in roles of project manager and application consultant.

The change manager controls the lifecycle of all changes conducted in the service. She ensures all changes are assessed, approved, implemented, tested and recorded in a controlled and standardized manner. The interviewed change manager is working in an offshore delivery. The service is delivered 97.09 % from offshore and the delivery responsibility is also in India. Only two full-time resources from Finland work in the service. Some other resources are also occasionally utilized from Finland when needed.

The change manager has been working in the industry and in offshore deliveries for about two years.

The interviewed consultant from SAP technical support works for different clients and services with different degree of offshoring. Nevertheless, he is mainly working with Finnish colleagues even in the case where the overall service is delivered in collaboration. His responsibilities include installing, configuring, updating, migrating, and troubleshooting the SAP technical environment. Technical support has a key role also in SAP transport management, when requests are transported from development environment to test and production environments. The interviewee's job mainly consists resolving incidents and service requests for various clients. He has been working in the current position for about 1.5 years.

In semi-structured interviews, the topics or themes to be discussed in the interview have been determined beforehand. However, there is flexibility with the questions and possibility to vary, for example, the order of discussing the themes. Planning the questions too strictly in advance, may prevent important aspects and themes from being raised by the interviewees. As there are several open issues in the service quality literature, the author wanted to keep the interview open for these aspects and themes and, thus, the questions were planned quite loosely. Their main purpose was to feed the conversation and help guiding the discussion if it is about to go off the track. The conversation flow is quite free and the tone of the interview is fairly conversational and informal in semi-structured interviews. Yet, the materials are somewhat systematic and comprehensive. (Eriksson & Kovalainen 2008; 82; Saaranen-Kauppinen & Puusniekka 2006.)

The topic was explained to the interviewees initially when they were invited to the interview. In addition, the actual interview was started with briefing where the topic was once again explained as well as the reasons behind the interview. Also, permission was asked to record the interview in order to focus on the discussion and not to writing notes. Every interviewee accepted recording. First they appeared slightly uncomfortable with it, but once the discussion started, they seemed to forget about it almost instantly. A recording program from laptop was used, which may have helped the interviewees to relax as they did not see a traditional recording device on the table continuously reminding them about the recording. All respondents were answering openly to questions. A more intimate and relaxed meeting room was booked to foster a good interviewing atmosphere. It may have also helped that the interviewer is from the same organization and all interviewees knew me already beforehand. Personal experiences in the company and in the industry also helped to understand the industry and company-specific jargon that came across during the interviews. All interviews were conducted in Finnish, but some English was mixed in some extent as some industry specific terms are commonly referred in English.

All planned themes were covered in the interviews but the order of questions or themes varied depending on the natural flow of discussion. The interviews covered the following themes:

- Quality as a concept
- The subjective and/or objective nature of service quality
- Expectations and prejudice towards offshore deliveries
- Quality produced in India
- Proactiveness of offshore resources
- Indicators of quality
- The scarcity of collaborative deliveries

In addition, at the end of the interview with the quality lead, she showed some tools the quality team uses in quality audits. There were also some additional questions to her related to the QMS, which were not covered with the other interviewees as they did not have as extensive understanding of the system. After the interviews, the recordings were transcribed from the tapes. The whole interviews were transcript as recommended by Kowal and O'Connell (2004) even though it is time-consuming. This ensures not to relate text passages too hastily to the researcher's own questions and not to overlook the text passages which does not have such obvious connection to the question. The transcript was done on the evening of the interview in order to have the discussion in fresh memory. The quality of the recordings was high and no issues were encountered in the transcript process.

The analysis started with carefully re-reading the transcripts like suggested by Schmidt (2004). In the first phase, each interview transcript was read through. At this stage, the aim was not to consider the interviews comparatively. While re-reading the transcripts carefully, categories were identified from the answers. In the second phase of the analysis, the material was coded. In other words, particular passages in the text were related to a category (or to categories). Some passages of text were found to be related to several categories. In semi-structured interviews the important text passages are not always found in direct context of the asked question (Kowal & O'Connell 2004). For this reason the repeated re-reading of the transcripts is important. At this stage, some data that was irrelevant for the analysis was ruled out. The transcripts were printed on paper to support the data analysis process. Some parts of the answers were highlighted with markers and the data was literally broken down as passages of text were clipped from transcripts with scissors. Then the data was grouped together so that they created themed categories. Throughout the analysis notes were written down. The results are discussed in the next chapter (sub-chapters 6.4–6.9). Finally, interpretations were drawn and these are discussed together with the conclusions from the quantitative analysis in Chapter 7.

## 6 FINDINGS

### 6.1 Resolution time in different delivery modes

First the resolution time, i.e. the time spent from submitting to resolving the incident (“submit to resolve”), is analyzed. The data is not normally distributed, which was expected from its nature. The incidents that the focal company handles vary greatly by nature and, therefore, also the resolution times vary greatly. There is a massive amount of incidents that can be resolved quickly. Especially incidents that are created based on infrastructure events, such as a canceled batch jobs, are typically very quick to resolve. This causes a strong skewness and kurtosis to the distribution. On the other hand, in some cases the incident resolution can take very long time especially if it is pending at some point for example a client decision or a third party solution. Due to these differences in incident natures, the boxplot is filled with extreme scores. The distribution of the data sets limitations to selecting the tests made with SPSS.

Kruskal-Wallis and Jonckheere-Terpstra tests fit the resolution time analysis. The null hypothesis, tests, p-values and the test conclusions are summarized below in Figure 9 and discussed further below. Significance level of  $\alpha = 0.05$  was used in the analyses. The Kruskal-Wallis test is the non-parametric test equivalent to the one-way ANOVA and it allows comparison of more than two independent groups.

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Submit to Resolve is the same across categories of Delivery mode.	Independent-Samples Kruskal-Wallis Test	,000	Reject the null hypothesis.
2	The distribution of Submit to Resolve is the same across categories of Delivery mode.	Independent-Samples Jonckheere-Terpstra Test for Ordered Alternatives	,000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Figure 9 Test summaries for resolution time

The Kruskal-Wallis test null hypothesis is that the populations from which the samples originate have the same median. However, based on the results the null hypothesis is rejected and, thus, the results indicate that the resolution time is significantly affected by the delivery mode,  $H(2) = 31.15$ ,  $p = 0.000$  (see Figure 12 Independent-samples in Kruskal-Wallis test from Appendix 4). The pairwise comparison gives more infor-

mation on how resolution time is affected by the delivery mode. See Figure 13 from Appendix 4 for the results of the pairwise comparison and Figure 14 from Appendix 4 for the effect sizes<sup>10</sup>. Pairwise comparisons with adjusted p-values show significant difference between resolution times when delivery is executed onshore compared with offshore ( $p = 0.000$ ,  $r = 0.036$ ). Similarly, there is significant difference when comparing onshore and collaboration deliveries ( $p = 0.001$ ,  $r = 0.034$ ). However, there is no significant difference between resolution times in offshore and collaboration deliveries ( $p = 0.348$ ,  $r = 0.010$ ).

These test results only implies that there is difference between the delivery modes, but does not explain how these differ. Jonckheere-Terpstra test provides insight on this question. Similar to Kruskal-Wallis test, it is a non-parametric method and does not assume a normal distribution. Jonckheere-Terpstra test reveals a significant trend in the data: the resolution times decreases when moved from onshore to collaboration, to offshore,  $J = 115\ 342\ 184$ ,  $z = -5.073$ ,  $p = 0.000$ ,  $r = -0.029$ . See Figure 15 and Figure 16 from Appendix 4 for independent sample and pairwise comparison in Jonckheere-Terpstra test.

## 6.2 SLA compliance in different delivery modes

In addition to the above analysis on resolution times, achieving SLA times was analyzed. The tests utilized for resolution times analysis, cannot be conducted for SLAs as it is a categorical variable that can get two values: “met” or “missed”. Cross tabulation is suitable for analyzing categorical variables and it was selected for the analysis. Service Level Agreement (SLA) outlines the deadline when an incident has to be responded to (“response progress”) and when it has to be solved (“fix progress”). As mentioned before, the same data used in resolution time analysis was used in the fix progress analysis (29 986 incidents in total). The data consists of 4 644 onshore incidents, 6 343 collaboration incidents, and 18 999 offshore incidents. Within all delivery modes 98.2 % met the SLA time to fix an incident (and respectively in 1.8 % fix SLA was missed). Within each delivery mode SLA response times were met as follows: 99.1 % in offshore deliveries, 97.0 % in collaboration deliveries and 96.1 % in onshore deliveries. At the 0.05 level, there is significant dependency between the delivery mode and whether agreed SLA fix times are met as Chi-Square ( $\chi^2$ ) was 0.000. See Figure 17 from Appendix 4 for details.

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<sup>10</sup> SPSS does not include effect sizes in the output, but they can be calculated with the following formula  $r = z/\sqrt{N}$

For response progress cross tabulation additional 3 509 incidents had to be removed because the response due date/time data was missing for these entries. The distribution of incidents into different delivery model categories was the following: 3 567 onshore incidents, 5 541 collaboration incidents, and 17 369 offshore incidents. All in all 96.1 % of the incidents met the given SLA respond time (and respectively 3.9 % missed it). The results indicate that offshore deliveries meet SLA response times most frequently (97.7 %), onshore deliveries the second frequently (95.4 %) and collaboration deliveries less frequently (91.8 %). The Chi-Square ( $\chi^2$ ) was 0.000 signifying that there is significant dependency between the delivery mode and whether agreed SLA response times are met ( $\alpha = 0.005$ ). Thus, both cross tabulation analyses suggest that offshore deliveries meet the agreed SLA times the most often. No apparent reason was found for the observation that collaboration deliveries performed better than onshore deliveries in fix progress but worse in response progress. See Figure 18 from Appendix 4 for details.

### 6.3 Trustworthiness of the quantitative analysis

To summarize the results, at the  $\alpha = 0.05$  level of significance, there exists enough evidence to conclude that there is a difference between the resolution times in different delivery modes. Furthermore, the analysis indicates the services delivered from offshore have the shortest resolution times whereas onshore deliveries have the longest. Similarly, offshore deliveries meet the agreed service levels most frequently. The order of onshore and collaboration deliveries was different in SLA response and fix; onshore deliveries meeting SLA response more often than collaboration, but collaboration deliveries meeting SLA fix more often than onshore. The effect sizes were quite small which implies that delivery mode explains only small part of the variations in the analyzed variables. This was natural and expected from the nature of the variables. The variations are, nevertheless, statistically significant.

The quantitative measures speak for the validity and reliability of the analysis. However, several problems overshadow the data. First of all, the delivery modes are not equally represented in the data. Approximately 57 % of the service engagements fit in the onshore delivery mode whereas 36 % fit the offshore and only 7 % fit the collaboration delivery mode. This was surprising as the general perception among the employees in the focal company is that most services are delivered in collaboration with the Indian colleagues. During the analysis it was ensured that the result reflects the true delivery modes and external factors do not create distortion in the data. For instance, the effect of service desk's role was analyzed to find any distortions. Service desk has a significant role in the incident life cycle as they open and close all incidents. Thus, not surprisingly, majority (56 %) of incidents in the data was assigned to service desk. All services have

primary service desk either in Finland or in India, which may cause distortion to the data. If the incidents were to be solved 50 % onshore and 50 % offshore, but the service desk was onshore, the service engagement may be categorized as onshore delivery as most of the incidents could be assigned to Finland (even the ones resolved in India would be opened and closed by onshore service desk). To further analyze this possibility, the incidents assigned to service desk were excluded from the data. However, the analysis revealed that the division to onshore, collaboration and offshore deliveries was exactly the same with or without service desk incidents. There were some changes in figures, but the changes happened within the frames for given delivery mode. Thus, the prior classification of services to different delivery modes remained true and the role of service desk did not create any distortion to the division of delivery modes.

Majority of incidents occur in offshore deliveries, as illustrated in Table 7. Surprisingly, collaboration deliveries are second best represented in the incident data even though only one service fits the collaboration delivery mode category. That one service is, however, the biggest service engagement in the focal company. Onshore deliveries account only a minority of the incidents. As incidents can be described as interruptions in the service, a high amount of incidents may signal poor quality. However, this conclusion cannot be made from the data as the service contracts are very different from each other. Naturally more incidents can be expected from a service engagement where the contract covers AMS for all SAP modules for a large client versus a contract that covers only a few modules for a smaller client. Also a large number of sequential batch jobs may cause more incidents when compared to client that has fewer batch jobs. Thus, no direct conclusions can be drawn by the number of incidents in each delivery mode

Table 7 Division of incidents in different delivery modes

	Resolution time and SLA fix analyses		SLA response analysis	
	Incidents	% of total	Incidents	% of total
<b>Onshore</b>	4644	15 %	3567	13 %
<b>Collaboration</b>	6343	21 %	5541	21 %
<b>Offshore</b>	18999	63 %	17369	66 %
<b>Total</b>	<b>29986</b>		<b>26477</b>	

The unequal distribution of incidents is partly due to the second problem the data suffers from; different kinds of incidents are not equally represented in each delivery mode. For example at least some of the offshore deliveries have a great amount of incidents created by the system based on infrastructure events. As explained before different types of incidents require different amount of time and effort to solve them. Often the incidents created by the system based on infrastructure event are quick to resolve. As a result the analysis of resolution times and SLA may reflect more the different na-

tures of incidents across the delivery modes rather than the capabilities and efficiency in solving the incidents onshore, offshore or in collaboration. The differences in incident types are, however, difficult to control from the data because, as explained earlier, the incident types are not used in consistent matter across all clients. The differences in the incidents, nevertheless, impair greatly the comparability of the delivery modes. To draw further conclusions on the resolution and SLA times, these differences should be controlled.

In addition, other issues compromising the comparability were identified after the analysis. First of all, Finnish consultant's standard workday is 7.5 hours whereas Indian consultant's is 9 hours. Second of all, many Finnish consultants assert they help their Indian colleagues often through an internal communication tool Lync (online messaging software). Some argue they provide help daily whereas others weekly and some less frequently. The time onshore team spends on helping their offshore counterparts may accelerate the resolution time for incidents assigned to offshore team whereas it is away from the time available to resolve the onshore team's own incidents. As these hours are not reported anywhere they cannot be analyzed. Third of all, there have been several observations that the incident statuses are not used in agreed manner. If incident status is set to 'pending' the SLA time does not run and, thus, SLA times are kept artificially. Again, there is no statistics on these misuses and, therefore, it is difficult to control or analyze it.<sup>11</sup>

To conclude, the results presented from the quantitative analysis need to be considered with caution. Nevertheless, these observations are highly important when discussing quality in the focal company as they reveal there is a need for more data on several frontiers to gain knowledge on the company's service quality. Moreover, the misuse of incident status can be seen as quality defect itself. In order to study quality in different delivery modes from other perspectives than only the promptness of the service and the compliance with SLA, a number of themes were studied through interviews. The findings are discussed in the following chapters based on these themes.

## 6.4 Quality as a concept

All of the interviewees had similar answers to the question of what is quality. Some of the interviewees had to think for some time before giving an answer. This demonstrates the abstract and illusive nature of quality, which has been discussed previously in this

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<sup>11</sup> During spring/ summer 2015 an initiative was started at the focal company in order to ensure statuses are used in uniform manner regardless of the user and/ or user's country unit

study. They felt quality is about fulfilling the client needs and requirements as well as supporting the client's business. The consultant was more precise and concrete in his answer than rest of the interviewees, which I felt was quite natural as his role requires handling many detailed tasks whereas the other roles have more to do with the overall picture. He described that IT quality is about solving incidents within target times. He also pointed out that good quality requires truly solving the root cause of the original problem. He explained that in technical support several monitoring tools are utilized and at the time of receiving the incident the tool may already indicate green status. There may be a temptation to report the incident as solved as the problem does not exist anymore. However, to deliver high quality, the root cause needs to be investigated and analyzed whether additional actions are required to prevent same issue arising again.

Most of the interviewees felt that the quality of IT services is not distinct from the quality of other service industries. Each industry has its own characteristics but the concept is, in essence, the same for all service industries. However, the industry-specific characteristics may require industry-specific measures. The quality lead also noted that IT service has standardized processes based on, for instance, ITIL that support delivering high quality. Some other industries do not have similar quality frameworks.

The interviewed consultant also pointed out that the concept of quality varies depending on the role within the organization. The customer service situation and, therefore, also the sense of quality, is very different for instance in technical support and in user support.

*“If you compare for instance basis team [technical team] and work in SAP user support, the customer service situation is very different. The user support is in contact with the client via phone whereas we in basis team get the information of an error from a system. For us quality is about handling it fast and getting the problem fixed. For user support the quality is more similar to other services; taking the customer into account, being friendly, being prone for helping etc. It [the sense of quality] varies by how technical part of the IT service you're handling”. (Consultant)*

The respondents had quite convergent opinions on the subjectivity and/or objectivity of service quality. All of them thought that quality can be seen objective but also subjective. The consultant summarized the division:

*“The areas of service that include more intercourse with people, goes to the subjectivity, but more technical areas goes to objectivity”(Consultant)*

He explained that *“you cannot disagree – at least as easily – on technical issues”*.

All of the respondents seemed to think that there should be objective measures for quality that are not affected by the subjective views of an individual. Two of the respondents (change manager and quality lead) pointed this out explicitly and others implicitly. Several respondents indicated that the objective quality is perceived as the true state of quality. For instance the consultant was explaining that external issues, such as the mood of the client, affect the perception of service quality. Based on these issues, the quality can be evaluated better or worse than it *truly* was.

The way respondents perceived the subjectivity and objectivity of the quality, supports the methodological stand taken in this study. Their replies match to the belief in critical realism that people look at the service quality through their personal lenses and they may interpret truth differently.

## 6.5 Indicators of quality

When asked about the quality indicators or measures, all respondents had quite similar replies. None of them had, however, a direct list in mind but the replies were rather pondering. Many of them also indicated that there would be more indicators available which they did not directly appoint (for instance by saying “and so on” to the end of their list). The respondents listed measures such as client satisfaction survey results, system availability, several indicators from incident management and the trends in these figures. In addition, the service manager named face-to-face meeting with the client to be very important source of information.

*“Service meetings are the most important where the primary feedback is given if there is some quality issues. [...] For me the opinion from the client is the most important indicator. Of course there is also monitoring with incident management and response times and so on, which is one out of many measurements.” (Service manager)*

The named indicators related to incident management were reaction and resolution times, meeting SLA and changes in number of incidents. The change manager also pointed out that the importance of client understanding the different indicators and the reasons behind changes in trends. If there is a sudden rise in the number of incidents, it may signal from greater problem in the system. On the other hand, a sudden drop in the number of incidents is not necessary a great result. It may be caused by a malfunction in automatic monitoring tool. The consultant pointed out that statistics from incident monitoring is not always so straightforward because, as mentioned already before, different consultants have different ways of handling the incidents. The service manager was also aware of this problem. In addition, some incidents may be impossible to resolve within

the given SLA time. Only the urgency and impact are considered when determined the time whereas, for instance, the complexity of resolving the incident is not taken into account.

The service manager explained that also realistic work estimates and staying within budget indicate high quality.

*“One quality measurement is budget and holding to work estimates. I think it is a good measurement that realized work is within the estimate. If we go over budget or too big estimate is given, it signals that we don’t know the stuff... Or that is how I see it”*  
(Service manager)

Interestingly the QMS audits were not considered, at least directly, as quality indicators. The service manager explained that the audit evaluates more whether you have the quality indicators in place and processes that support high quality. The quality lead also described the audits as indicator of how well the QMS is followed and not directly the realized quality. She also explained it is not an indicator that would be signaled to the client but something that is communicated internally especially to the management.

## **6.6 Expectations and prejudice**

The service manager and the consultant felt that clients have prejudices towards service delivered offshore. However, in their opinion the way the prejudices impact the perceived service quality was not consistent. In some cases the expectations and prejudices may have a positive impact to perceived quality but in another case it may have a negative impact. They listed that the person, the situation and the end result affect to the magnitude and direction of the impact to the perceived quality.

The quality lead did not admit experiencing any prejudices from client towards service delivered from offshore. The change manager had encountered to some skepticism or reservation towards Indian resources but not with her current client. She pointed out, thought, that the organization she works for is at a mature point of offshore relationship and previously there may have been prejudices:

*“No, there has not been any [prejudice from the client], the opposite. Well... I have not been [working in the service engagement] from the very beginning and probably there is more [prejudice] in the start. The language, how [the offshore delivery] will work, and these kinds of issues [may cause prejudice].”* (Change manager)

The differences in experienced prejudices may be due to the fact that the respondents work with different client organizations and with persons from different levels and units of these organizations. There seem to be much difference in attitudes towards offshore between organizations and even within a specific organization. The organizations that are international and use English as the corporate language seem to be more open for offshore deliveries. Organizations and/ or individuals that, on the contrary, work mostly in Finland with Finnish people, seem to be more skeptical.

## 6.7 Quality produced in India

The perceptions towards quality produced in India varied to some extent between the respondents. The change manager, working in offshore delivery, was certain that the offshore team delivers high quality and that the client has also been very satisfied with the quality.

*“I have a very good picture of the Indians. They are really skillful and very enthusiastic, and understand the [Finnish] culture” (Change manger)*

She argued that, as the offshore team has been working for a long time with Finnish clients and colleagues, the collaboration with Finns is easy.

*“They have been able to adapt to Finnish ways of working. They know what is expected from them and if they promised something, they keep the promise. That is not so typical in their culture. [In India] one can say “yes yes” and “I’ll do it” but in reality it doesn’t go like that. Those who have been working [with Finns] have absorbed well [in Finnish working culture].” (Change manger)*

As explained before, the focal company’s unit in India has a resource pool that concentrates only to clients in Finland. This probably helps the offshore resources to adapt to the onshore business culture compared to situation where they would work for clients from different cultures. Moreover, the company has long roots in offshore collaboration, which has build up the organizational knowledge on how to deliver from offshore. The local unit and the group also provide a lot of support for organizing offshore deliveries. In addition, most new resources that join the Finnish county unit attend an internal training regarding Indian culture. The Finnish consultants are also advised to adjust to the Indian culture and not just the other way around.

The quality lead also said her experiences have been very positive. On the other hand, she admitted that the general impression is that Indians deliver poorer quality than

the Finns. Also she said that the quality produced in India varies to some extent. However, she explained that the quality problems are much due to communication issues. With proper instructions and taking cultural differences into account, possible quality issues could be eliminated. She also felt it is also a question of which type of work should be delivered from offshore and which tasks should be kept onshore.

*“You need to consider which tasks are transferred to India and not expect too much something that they will not deliver” (Quality lead)*

The consultant said his own experiences working with the offshore team have been positive and that the Indians handle tasks promptly. First he said he is not able to evaluate whether there is differences between the quality produced onshore and offshore. As the discussion continued, he did, nevertheless, identify some pain points in offshore deliveries. These included cultural and communicational issues which sometimes result in misunderstandings. Moreover, he guessed the Indian colleagues are overloaded which may cause occasionally forgetting some tasks.

The service manager had identified more problems than the other respondents and spoke about these openly. He felt that the offshore team is well capable of handling routine tasks but more advanced or complex tasks are too challenging for them. The reason for that is that they do not know the clients and their businesses well enough to solve more complicated problems.

*“They don’t know the systems on a level that they could solve the issues in similar manner [than the Finnish colleagues that have longer experience with the client and their systems]. [...] They have the will [to take on more complicated and meaningful work than just the routine tasks]. But there is one problem. Their roles are so short-sighted. They spend one or two years in some [role] and then they move on [in their career]. You cannot learn these clients and the job in one or two years. That is not enough, even more is not enough.” (Service manager)*

In addition, the service manager felt that there is a lack of commitment and ownership.

*“The total responsibility is dissimilar when you are at the other side of the world... To position yourself to that exact client relationship.” (Service manager)*

The discussion of offshore quality was the first theme to raise significant differences in the respondents’ views. The change manager genuinely argued that the services delivered from offshore have as good quality as or better than the quality produced from

Finland. The quality lead and consultant was saying the same at first but as the discussion continued around the theme, they brought up a number of weaknesses. At the beginning I felt they were quite cautious to say anything negative. The service manager, on the other hand, criticized openly that the quality delivered offshore is poorer due to inexperience.

## 6.8 Proactiveness

The Finnish consultants often complain at the office that offshore resources are not capable of solving problems independently and to be proactive. The service manager, consultant and quality lead had similar experiences that what you hear in the corridors. The quality lead explained:

*“India works based on culture so that you act according to instructions. And they are good at it. But they are not that proactive, because there are strong hierarchies and supervisor-subordinate relationships and it may culturally feel that you step on the other one’s toes if you give a lot of propositions. You should not expect similar proactiveness from there. Maybe it is better to transfer work that is done by following instructions to there. You can of course also find proactive individuals from there but they are scarce.” (Service lead)*

The change manager felt that the Indian employees are very proactive. She also admitted that the hierarchical culture may affect the readiness for being proactive, but it has not been a problem in the delivery. The offshore employees are divided to delivery teams and the team leads are perhaps the most proactive ones. She felt the offshore team is also proactive but they may do it differently than how we do it in Finland. The Indian team communicates any ideas via team leads whereas Finnish consultants are used to giving own ideas personally.

## 6.9 The scarcity of collaborative deliveries

When asked why there are so few collaborative deliveries, the responses varied between the interviewees. The quality lead was surprised of the results and said she would have thought majority of the services would fit the collaborative delivery category. She did not have an explanation for the discovery.

The change manager explained that language issues and prejudices may push for on-shore deliveries especially in cases where other factors than costs have higher priority.

On the other hand if the client organization is mature and open for service delivered from offshore, there may be a push for delivering the service totally from offshore due to cost pressure and availability of resources and skills in India. She felt that the offshore delivery model has been so successful that it has raised more interest and also there is internal push towards it in the focal company. Thus, there may not be a lot of demand for collaborative deliveries.

The consultant felt that the way incident management is handled prevents collaborative deliveries. At the moment certain areas of collaborative deliveries are handled from India and other areas from Finland. The onshore and offshore teams have separate work queues in incident management tool. If both, onshore and offshore, would handle incidents from the same area they should have common work queues. In addition, he recognized language barriers as an issue in collaborative deliveries. Often the incidents are described in Finnish and someone would have to translate them if an Indian colleague would handle the incident.

The service manager thought there were many limitations to utilize offshore team, mainly due to language barriers and limited understanding of client systems that it may result in lower amount of collaborative deliveries. In the service he manages, offshore team cannot directly contact for instance a warehouse employee at client organization due to language barriers. In addition, the responsibility areas are restricted to areas of daily monitoring and other pre-determined routine tasks. The way to understand the system and to get more responsibility is based on first managing the routine tasks.

## **6.10 Trustworthiness of the qualitative analysis**

The evaluation of trustworthiness in qualitative research is often found to be difficult. The blooming of different measures started when qualitative research community began to raise concerns to measures which were originally designed for quantitative research. As a result, researchers now have to find their way through a mass of conflicting suggestions. (Seale 1999.) To evaluate the trustworthiness of the qualitative research in this study, the criteria suggested by Lincoln and Guba (1985) was selected. They propose four criteria: credibility, transferability, dependability and conformability.

Credibility refers to the internal validity of the research, which aims to ensure that the study measures or tests what is actually intended (Lincoln & Guba 1985, 296). Eriksson and Kovalainen (2008, 170) describe it consists of the following aspects: the researcher's own familiarity with the research topic and setting, sufficient data for claims made in the research, and systematic analysis development between categories and observations. There are several factors that have enabled the credibility of this study. First of all, I was very familiar with the research topic prior to holding the inter-

views. At the time interviews were held, I had read hundreds of articles in areas of service quality and IT outsourcing and offshoring. In addition, I had worked in the industry for 1–2 years. Being familiar with the research topic facilitates correct interpretation of data. Second of all, covering different roles and experience levels in the interviews increase the level of credibility of the research. Moreover, the interview results were analyzed in a systematic way. The data triangulation also fosters credibility.

However, the study covered only four interviews and additional interviews could have strengthened the credibility of the study. The number of interviews was kept low as it was the secondary data source of the study and it was possible to cover different roles within the number of interviews held. Thus, the number serves the purposes of this study. At the beginning of the empirical part, the plan was to interview also offshore resources. However, after evaluating more carefully, it became evident that the credibility of these interviews would not have been on a required level. Thus, they were excluded from the scope. Neutral settings would foster fruitful results from the interviews. However, as the offshore resources are usually responsible to the onshore resources in the focal company, the setting would have been seen as hierarchical rather than neutral. For this reason the offshore resources would unlikely discuss openly the topic with me. One of the reasons for this stems from the high power distances in the Indian culture. In particular most probably any issues faced in deliveries would have remained unspoken. Credibility could be ensured by having an interviewer that is not working in the organization (which would neutralize the setting) or by building trust between the persons before the interviews. Trust is in a key role in Indian culture and it takes time to build the relationship on a level that there is enough trust to discuss any topics openly.

Transferability refers to showing that the findings are applicable in other contexts (Lincoln & Guba 1985, 290). However, it is not going to be evaluated here. As the purpose of this study is not to create a generalized theory, transferability is not a relevant criterion. Eriksson and Kovalainen (2008, 290) have suggested that it is crucial to select evaluation criteria that is compatible with the nature of the qualitative study in question. Nevertheless, next chapter will shed light into this as dialog with previous research is incorporated in the conclusions. Transferability can be measured through similarity of the research findings with previous researches (Eriksson & Kovalainen 2008, 294).

Dependability refers to showing that the findings are consistent and could be repeated (Lincoln & Guba 1985, 316–318). Research process that is logical, traceable and documented supports dependability (Eriksson & Kovalainen 2008, 310). The interviews were recorded and transcribed carefully. Moreover, the coding done in the analysis phase has been documented and the notes have been also saved. Another researcher could make similar findings from the recordings and other material.

Finally, conformability refers to the neutrality of the findings. It concerns evaluating to which extent the findings are based on the data and not shaped by the researcher bias,

motivation, or interests. (Lincoln & Guba 1985, 318–324). In addition to enabling dependability, the audit trail which was described above, also establishes conformability. Moreover, direct citations from the interviews have been included in the findings to demonstrate the source of conclusions. It should be noted that quotations have been translated from Finnish to English, which may cause a risk of some information getting lost in translation. The citations convey the same information content than the original Finnish transcripts and the words were selected carefully to reflect the original intentions of the interviewee. I had no personal agenda to push forward. Instead, I was truly curious of the topic and wanted to hear the opinions of the informants. Thus, I was trying to be careful not to set leading questions in interviews. In addition, during the process I tried constantly analyze if I had any biases and keep an open mind in collecting and analyzing the data.

## 7 CONCLUSIONS

### 7.1 Collaborative deliveries

The quantitative analysis revealed that collaborative deliveries are not as common in the focal company as generally believed among the employees. The interviews revealed some reasons for the low number of collaborative deliveries. Firstly, there are contractual restrictions as in some cases the service language has been determined to be Finnish. In these cases the client readiness for collaborative and offshore deliveries may not be at a required level. Secondly, it seems that the current way of allocating work in collaborative deliveries (or onshore deliveries with a portion done offshore) enforces some issues at the focal company. The interviews revealed this as the challenges that the service manager described were not present in the offshore delivery that the change manager was talking about. One of the key reasons for this seem to be that in collaborative deliveries, typically the routine tasks are allocated offshore and more advanced work is conducted onshore.

First of all, this creates high turnover of employees. As the service manager described, the routine tasks are perceived boring and, therefore, the employees do not want to stay in the job for long time. The tasks do not allow professional growth and may not satisfy the employee's wish to feel he is making valuable and important work. Ebrahimi (2009) has made similar findings and has argued that offshore employees have started to insist more meaningful task instead of the routine work. Second of all, as the routine tasks require only modest skills, often junior employees are assigned to the onshore and collaboration deliveries. As they have very little experience, they require a lot of support from onshore. This is not always visible to the client, but causes bad blood among Finnish consultants who need to invest their time to explain everything in detail to the Indian colleagues or to correct their mistakes. In addition, it demolishes the cost savings that was initially planned from offshore delivery as a substantial workload is required also from onshore team.

The issues create a self-enforcing loop because i) onshore does not want to allocate more demanding work to offshore as they do not feel offshore is capable of handling them due to inexperience and high turnover, and ii) offshore does not want to assign more experienced employees to the service delivery because their skills and knowledge is wasted in the routine tasks. This loop is illustrated in Figure 10. Offshore deliveries do not have such problems because the tasks are interesting, the employees are motivated and experienced, and the employee turnover is low. More research would be needed in this area as the interviews only covered limited amount of service engagements and same conclusion does not necessary apply to other engagements. In addition, taking

offshore perspective into account in more detail by interviewing offshore resources in further research, would add value. In this study all interviewees were working from on-shore.

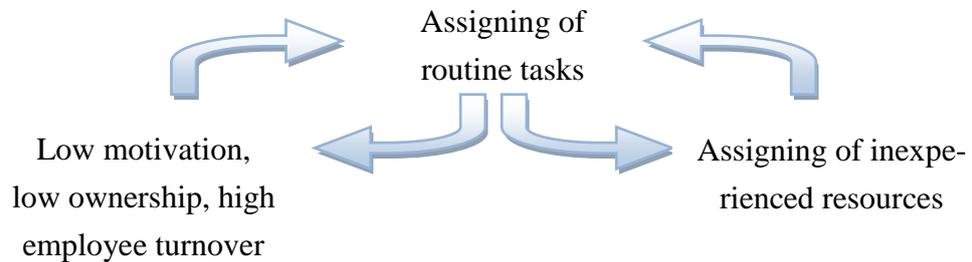


Figure 10 Self-enforcing loop from task/ resource assignment

Another point, which may diminish the challenges faced in offshore deliveries compared to collaborative deliveries, is that in offshore deliveries, the client is keen on building personal and long-lasting relationships with the offshore resources. The interviewed change manager described how the client has visited India several times and key resources from offshore have also visited the client in Finland. Moreover, the Indian team managers and service manager are in close contact with the client key personnel in daily operations. This enables better communication as well as commitment. In onshore and collaborative deliveries, the offshore resources are not typically directly in contact with the client. This is mainly due to language barriers but other reasons could be also found underneath. Nevertheless, the relationship, commitment and mutual ways of working does not evolve in similar manner due to lack of communication between the offshore employees and the client personnel. More research is needed also related to the communicational aspects and its affects to building commitment and relationships as well as mutual ways of working.

It is important to highlight that the interviews covered only some engagements and the results do not necessary reflect the situation in all deliveries. I have asked some other colleagues working in another offshore delivery for their experiences and they were not similar to the change manager's. In addition, some previous research has addressed the problem of high turnover in offshore deliveries (see for instance Weidenbaum 2005 and Lewis & Peeters 2006 discussed earlier in this study). In the interviews it was a problem in collaborative deliveries but not in offshore. Thus, in some companies the offshore deliveries may be suffering from the same symptoms as the collaborative deliveries covered in the interviews are suffering from. The root cause of the symptoms is not in the delivery mode itself but in the way of allocating the work and resources within the organization and within the delivery. Changing collaborative deliveries to off-

shore deliveries or offshore deliveries to onshore deliveries do not necessarily solve the underlying issues. In order to overcome the issues, the root causes has to be solved.

Moreover, discussions with colleagues working in different offshore deliveries reveal that the client organizations may have a substantial impact to how well the offshore delivery works. The organizational readiness to use offshore is high in the service that the change manager was taking about. The client uses English as their corporate language, they work in global marketplace and they are committed to the offshore delivery. Another client, in which the experiences of offshore delivery are not as good, uses Finnish as their corporate language, work mainly in Finland and do not seem as committed to the offshore delivery. Thus, the client that provides a good organizational fit for offshore deliveries has experienced a very successful offshore delivery. The contrary, the other client that provides a poorer fit, has had poorer experiences. This is an area that definitely deserves more focus and more research is required to make reliable conclusions.

Another interesting topic for further research would be to compare collaborative deliveries in projects and in services. In the focal company collaborative deliveries are more common in projects that they are in service engagements. This may have caused the illusion for the employees that collaborative service deliveries are more common in the focal company than what they actually are. Moreover, the division of work seems to be quite different in these. In projects the onshore and offshore resources work more collaboratively as a common team whereas in services work is often split to onshore and offshore team that do not work together as closely. Onshore and offshore have separated incident queues that they are handling. Nevertheless, in projects there seems to be a clear division of work as well. Often onshore is more involved in specification and testing whereas offshore is responsible for the development.

## **7.2 Quality in different delivery modes**

Quality in different delivery modes have been highly controversial topic in previous research. Studies have suggested very different outcomes and articles outside scholarly journals are often emotionally charged. Previous research has focused on comparing the quality in onshore and offshore deliveries but collaborative mode has been neglected.

In the broadest survey in Nordics to evaluate IT service providers, an Indian company, TCS, was ranked as the best outsourcing partner. The company achieved the highest scores on 11 indicators out of 12, and 85 % of their clients were satisfied with their performance. They received accolades, among other things, for their quality. (STT press release 2010.) However, there is also contradictory evidence. For instance Sjöblom (2012) found that one of the invisible costs of delivering an IT service from offshore

location was related to the loss in quality. In similar vein, an internal report, which was leaked to the public, made within NSN revealed that the overall cost for programming work done in India was surprisingly 35 % more expensive than in Finland. The wage, including indirect wage costs, of an Indian employee was only 30 % of the Finnish employee's wage. However, Finnish were found to be 4.5 times more efficient than their Indian counterparts. The code produced by Indian programmers had up to 40 times the amount of errors compared to the Finnish level. (Vänskä 2012; NSN selvitti ohjelmoinnin hintaa Intiassa 2012)

In Global state of quality -report (2013) Finland was ranked among the bottom ones. However, the ranking was conducted based on percentage of organizations using ISO as a quality framework and Finnish organizations are not ambitious to accomplish certificates (Pesonen 2013a). Indian companies, on the other hand, are keen on achieving the certificates. When judged by CMMI level 5 appraisals (which is the highest appraisal level available), the best IT consulting companies are found in India. In 2007–2012 India obtained more than double the amount of level 5 appraisals than the US, which holds the second place. (CMMI Maturity profile report 2013.) Nevertheless, the certifications do not actually measure quality but rather that the processes, which enable and support high quality, are in place.

The quality produced from India was seen quite controversial topic also in the interviews. The change manager was appraising the quality of offshore team whereas the service manager was more critical towards it. As discussed earlier the collaborative deliveries discussed in the interviews seem to have challenges that discussed offshore deliveries do not have. The way of allocating tasks and resources as well as the client organizational poor fit for offshore delivery seem to create and/ or enhance the issues. It seems that these explain the differences in experiences and opinions related the quality produced offshore.

In addition, it seemed that the quality issues are a taboo in the company as the respondents were quite circumspect in their comments related to any issues. At first the quality lead and the consultant did not raise any concerns, but after more probing it came out that they had faced some issues. Many of the issues seem to arise from cultural and communicational differences as well as lack of professional experience. Thus, they can be worked on if the issues are acknowledged by both parties. Small changes could improve the collaboration, such as Finnish employees understanding the importance of small talk and giving feedback, and Indian employees understanding that replying “yes” is perceived as a promise that has to be kept. The focal company's way of organizing the work may help in this. As explained before the offshore unit has so called Finland pool of resources that work only with Finnish clients. Thus, they become familiar with Finnish business culture, ways of working as well as the market and clients.

The quantitative analysis suggests that the services delivered from offshore perform the best. The analysis focused on the promptness of the delivery and, thus, only illustrates an area of the service quality. The results indicated that offshore has the shortest resolution times whereas onshore deliveries have the longest. Similarly, offshore deliveries meet the agreed service levels most frequently. However, as explained before, there are several issues related to the data and the findings should be considered with prudence.

### 7.3 Prejudice and expectations

The interview findings indicate that prejudice towards offshore delivery is higher at the beginning of an offshore delivery. Similar findings were revealed from the ORN survey and interviews, which indicated that customer reluctance to utilize offshore had often more to do with priori beliefs about the potential quality of service delivered with offshore resources than the actual quality of the service they received (Lewis & Peeters 2006). An interesting research topic would be to investigate in more detail how to get over the prejudices and are there effective methods to expedite the process. In addition to the client prejudices more light could be shed to the prejudices that onshore resources have to towards their offshore colleagues. For instance Zimmermann, Raab and Zanotelli (2013) found that German IT developers' attitudes towards their offshore colleagues varied greatly. Similar observations can be made at the coffee room of the focal company from the way different employees talk about their offshore colleagues.

The study gives grounds to challenging the disconfirmation paradigm that SERVQUAL is based on. Parasuraman et al. (1985; 1988) suggest that perceived service quality is determined by deducting the prior expectations from the actual performance. In other words, the lower the expectations are, *ceteris paribus*, the higher the perceived quality is. However, according to the interviewees' experiences the relationship between expected quality and the perception of realized quality is more complex. Low expectations can result to higher perceived quality as the client may be positively surprised and, as a result, perceive the quality to be better than if he had neutral expectations. However, it may also result to lower perceived quality as the client may (consciously or more likely unconsciously) seek for or interpret performance in a way that confirms their pre-existing views<sup>12</sup>. The interviewees argued that various factors influ-

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<sup>12</sup> In psychological literature this behavior is known as confirmation bias. For more details, see for instance Nickerson R. (1998) Confirmation Bias: A Ubiquitous Phenomenon in Many Guises. *Review of General Psychology*, Vol.2 (2), 175–220.

ence the magnitude and as well as the direction of the impact that the expectations have to the perceived service quality. These factors include personal characteristics, such as optimism or pessimism, the current mood of the person and recent events in the service.

The results from previous research gives also grounds for questioning the disconfirmation paradigm. Some prior research has indicated that customers without previous offshore experiences are worried about the quality of service delivered with offshore resources (Lewin & Peeters 2006). If these findings are discussed in the light of disconfirmation paradigm they would mean that the client expectations (E) for offshore work would be lower than for onshore work due to fear of quality losses. Thus, the offshore unit would always achieve a higher perceived quality according to the disconfirmation paradigm. Some researchers have, on the contrary, proved that the prejudices towards offshoring have the opposite effect to perceived quality. Sharma (2012) revealed that “customers with less (more) favorable attitude towards offshore outsourcing perceive lower (higher) service quality and satisfaction with offshore customer service centers”. Moreover, as described earlier in this study, several studies have directly challenged the gap score. To summarize, the results from the qualitative analysis of this study as well as previous research do not support the disconfirmation paradigm that SERVQUAL presents. The results do suggest that the expectations and prejudices affect the perceived quality, but in a way that cannot be determined with a straightforward formula.

## 7.4 Quality indicators

Several authors have suggested quality metrics for the service industries such as SERVQUAL or INDSERV. Moreover, some researchers such as Leptmets et al (2011; 2012) have proposed IT industry specific quality metrics. However, none of these have achieved an established position in literature or in practice. The AMS business has, however, several metrics that have become standard in the industry. These include for instance SLA, which was also examined in this study. Nevertheless, the metrics do not provide an overall picture of the delivered quality but rather areas of it. When asked about the quality indicators from the interviewees, their replies were vague lists of metrics. The replies included phrases such as “one of many metrics” or “and so on” which indicated that there would be more metrics which they did not name directly. None of them gave a firm description with specific set of metrics. Moreover the quality lead described that these are always agreed mutually with the client. Thus, there may be some variations between clients. All in all, measurement of quality still remains a vague area that requires more attention.

Several metrics are needed to get a comprehensive understanding of the state of quality. Some indicators may be relevant in one role whereas not in others. For instance

some service quality attributes suggested in SERVQUAL, such as courteous toward customers or employees appearance, are relevant in customer contact situations. However, as the consultant pointed out, the technical team is seldom in contact with customer and these attributes do not indicate the quality of their service. They are, nevertheless, relevant to indicate the quality of service provided in user support.

Moreover, there are difficulties to measure even the established indicators in the focal company. As described before the data used in the quantitative analysis had several challenges. Without reliable and uniform data, it is difficult to make any conclusions regarding the state of the quality. In addition, there would be a need to control some attributes from the data and to have more information on some details. Because of the data issues, it can be questioned whether the findings from the quantitative analysis are reliable or not. It is naturally also a noteworthy finding itself that the data gather process has shortcomings. The company has limited possibilities to analyze its current state and any improvements in the area of quality if only limited amount of data is available and it is partly unreliable. In fact, the focal company has already started initiatives to improve the situation.

## 8 SUMMARY

Previous research on outsourcing and offshoring can be described to be rich by nature. The drivers and deterrents for offshoring have been well examined and understanding has been gained related to specific offshoring locations such as India. The key concepts and topics related to offshoring were presented at the beginning of this study. Much of the literature has focused on manufacturing industries, but some studies can be also found related to the service industries. The field contains several research gaps. This research has focused on to narrowing the gap related to service quality in different degrees of offshoring.

Several empirical studies have helped us to understand and evaluate service quality. However, the interception with the offshoring research field has remained light. Moreover, even some of the basic concepts in service quality remain ambiguous and debated, the managerial implications have been poor and research findings lack consistency. The application management services, that this study focused on, were introduced in chapter 3 followed by chapter introducing previous research on service quality. The conceptualization of service quality and different proposals for measuring the quality were examined. In addition, the industry best practices were discussed.

After the literature review, the data and methodology were described. Mixed-method was used to study the service quality in different degrees of offshoring. First of all, quantitative analysis was performed on incident data to analyze the promptness of the service. Resolution time was examined with Kruskal-Wallis test as well as Jonckheere-Terpstra tests. In addition, SLA compliance was analyzed with cross tabulation. Second of all, a broader set of sub-topics related to service quality was covered in semi-structured interviews. The interviews covered the following topics: quality as a concept, the subjective and/or objective nature of service quality, expectations and prejudices towards offshore deliveries, quality produced in India, proactiveness of offshore resources, indicators of quality, and the scarcity of collaborative deliveries.

Several conclusions can be drawn from the empirical part of the study. First of all, the findings imply that the way tasks and resources are allocated in collaborative deliveries may cause issues. Routine tasks are assigned to offshore. This results in low level of motivation and ownership as well as high level of employee turnover, which again result in assignment of routine tasks to the offshore team. On the other hand, inexperienced employees are assigned to collaborative deliveries. As a result only routine tasks are assigned to the offshore team, which again results in assignment of resources with low level of skills to the delivery. The self-enforcing loop is difficult to overcome if both parties only look the situation from their own perspective. It is noteworthy that the same symptoms can be found from any delivery mode if same root causes are present in task and resource assignment. Thus, it is not directly an issue caused by collaborative

deliveries even though it was found to be present in collaborative deliveries in the focal company. The fact that the client is keener on developing the relationship and mutual ways of working in offshore deliveries may help to overcome the issue.

Quality in different delivery modes was found to be controversial topic in this research, in similar manner than it has been in previous research. The quantitative analysis suggested that offshore deliveries are capable of delivering higher quality when promptness is used as the criteria. The interviewed change manager testified the same also for other areas of service quality. On the contrary, the interviewed service manager had very different view on the topic. The challenges that task and resource assignment create may have affected the evaluation of the interviewees.

The study supported previous findings that prejudices towards offshore deliveries is higher at the beginning of an offshore delivery. On the contrary it did not support the disconfirmation paradigm. The results suggest that expectations and prejudices affect the perceived service quality but in a non-predictable way.

Previous research has been unable to agree upon the service quality indicators. This study was not able to confirm previous suggestions either or to propose new indicators. The findings indicate that measurement remains vague not just in academia but also in practice. The data gathering process in the focal had several shortcomings. Improvements are needed to have reliable and meaningful data for analysis.

The study at hand also proposed several topics for further research. In addition to the above mentioned, the trustworthiness of this study was evaluated. The limitations of the study should be taken into consideration when reading the findings and conclusions.

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## **APPENDIX 1 INTERNATIONAL STANDARDS AND FRAMEWORKS**

This appendix focuses on the international standards and frameworks that one comes often across in IT service industry. The standards and frameworks provide guidance to put processes in place which ensure and/or enable high level of quality. One does not have to understand these to understand this study, but they are explained here for the persons who are interested in the topic.

### **ITIL - The Information Technology Infrastructure Library**

ITIL is a set of best practices in IT service management published as a series of books. The objective of the ITIL service management framework is to provide guidance to all types of organizations that provide IT services to business. (Brewsrer et al. 2010.) ITIL was developed by the United Kingdom's Office of Government Commerce (OGC)<sup>13</sup> twenty years ago in order to enhance the quality of IT services produced by the British Government. Thus, it has aimed to achieve quality improvements since its initiation. Since the beginning, ITIL has provided a framework for best practices, but also a common approach and philosophy based on practical experiences. Initially its use was confined mainly to UK and the Netherlands, but later it became adapted globally. (itSMF ITIL V3 2007.)

The second version of ITIL was published between 2000 and 2004. The initial version of ITIL, consisting of a library of 31 books, was revised and replaced by seven, more closely connected and consistent books consolidated within an overall framework. ITIL version 2 became universally accepted, gaining its current status as de facto standard in service management. The next and most recent version was published in 2007 and updated in 2011. ITIL version 3 provides a more holistic perspective focusing on the life cycle of services, whereas version 2 was more concentrated on individual processes. Version 3 consists of Core Guidance and Complementary Guidance. The Core Guidance includes five books, each covering a stage of the service lifecycle: Service Strategy, Service Design, Service Transition, Service Operation and Continual Service Improvement. (itSMF ITIL V3 2007.)

The Complementary Guidance provides frameworks, standards and models that enable utilization of Core Guidance. ITIL differs from many standards in a way that an organization cannot be assessed and certificated for ITIL. However, individual employees can be certified as ITIL-compliant. (itSMF ITIL V3 2007.) ITIL can be used in con-

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<sup>13</sup> At the time it was Central Computer and Telecommunications Agency (CCTA) which was subsumed into OGC in 2000.

junction with other frameworks, best practices or standards, such as COBIT (Control Objectives for Information and Related Technology; a framework for IT governance and controls), Six sigma (a quality methodology), and ISO/IEC 20000 (a standard for IT service management, which is discussed below) (ITIL basics).

### **ISO/IEC 20000 Information technology service management**

ISO/IEC 20000 is the standards for IT service management. ISO (the International Organization for Standards) and IEC (the International Electrotechnical Commission) are bodies that set international standards. They have formed a joint technical committee ISO/IEC JTC 1 to develop, maintain, promote, and facilitate standards in the IT and ICT field. (ISO/IEC 20000-1:2011.) The committee developed ISO/IEC 20000 in 2005 based on its predecessor BS 1500, developed by the British Standard Institution (itSMF ISO/IEC 20000). Revised version of the standard was published in 2011. The standard aims to advance producing cost-efficient IT services that have high quality. This is achieved with uniform and efficient processes. The first part of the standard, i.e. ISO/IEC 20000-1, comprises of service management system requirements, including “the design, transition, delivery and improvement of services that fulfill service requirements and provide value for both the customer and the service provider”. The other parts of the standard include additional guidance. ISO/IEC 20000 enables the service provider to align or fully integrate multiple management system standards. For example, a service management system can be integrated with a quality management system based on ISO 9001. (ISO/IEC 20000-1:2011.)

The need for internationally accepted common standard emerged as the usage of generally accepted frameworks, such as ITIL, rose. Another driving force has been the US Sarbanes-Oxley legislation and requirements derived from it, which fall upon IT services among other lines of business. (itSMF ISO/IEC 20000.) ISO/IEC 20000 is aligned with, but not dependent on, ITIL (Brewster et al. 2010). As you cannot certificate an organization for ITIL, ISO/IEC 20000 is often referred as the organizational level certificate for it. However, there are some taxonomical and contentual differences between the two. For instance Continual Service Improvement introduced in ITIL version 3 is not incorporated into ISO/IEC 20000. On the other hand ISO/IEC 20000 includes a number of additional requirements not detailed within ITIL. As a formal standard ISO/IEC 20000 defines a set of requirements that focus on what must be achieved rather than how it is done. ITIL, on the other hand, provide guidance about how different aspects of the solution can be developed. (Brewster et al. 2010.) Even though ISO/IEC 20000 was originally developed to reflect ITIL, it equally supports other IT service management frameworks, such as COBIT.

### **ISO 9001 Quality management system, requirements**

ISO 9001 sets the requirements for quality management systems. All the requirements are generic and intended to be applicable to all organizations. ISO 9001 can be applied to any line of business, whereas ITIL and ISO 20000 introduced above, focus on information technology field. Its applicability to all fields and organizations is reflected in its popularity; the standard has been implemented already by over one million organizations. The requirements are divided into five categories: quality management system, management responsibility, resource management, product realization and measurement, analysis and improvement. It is part of the ISO 9000 quality management standard family and supplementary to the other standards in it. However, ISO 9001 is the only standard in the family which is audited. (ISO 9000; Ruikka 2009.)

The ISO 9000 family is based on eight quality management principles. These principles are derived from collective experience and knowledge of international experts, who also develop and maintain the ISO 9000 standards. The principles are customer focus, leadership, involvement of people, process approach, system approach to management, continual improvement, factual approach to decision making and mutually beneficial supplier relationship. (ISO 9000 principles.)

### **CMMI - Capability Maturity Model Integration**

CMMI models are collections of best practices, similarly to ITIL, that help organization to improve its processes. CMMI models provide guidance for organizations that are developing their processes. The models are developed by experts from industry, government and the Software Engineering Institute (SEI). In the 80s and 90s there were several CMMs which were then integrated into CMMI for Acquisitions, CMMI for Development and CMMI for Services. CMMI for Development (CMMI-DEV) is particularly popular within the IT consultancy industry. It is a reference model that covers activities for developing both products and services. It contains practices that cover, among others, project and process management, software engineering and other supporting processes in development and maintenance. (CMMI-DEV, V1.3 2010.)

CMMI represents levels that describe an evolutionary path recommended for an organization that desires to improve the processes it uses to develop products and services. CMMI supports two alternative improvement paths using levels. Capability levels enable organization to incrementally improve processes corresponding to an individual process area (or a group of process areas) selected by the organization (Figure 11a). Maturity levels, on the other hand, enables organizations to improve a set of related processes by incrementally addressing successive sets of process areas (Figure 11b). The differences between the structures of the representations are subtle but significant. The continuous representation uses capability levels to characterize the state of the organization's processes relative to an individual process area, whereas staged representation

uses maturity levels to characterize the overall state of organization's processes relative to the model as whole. (CMMI-DEV, V1.3 2010.)

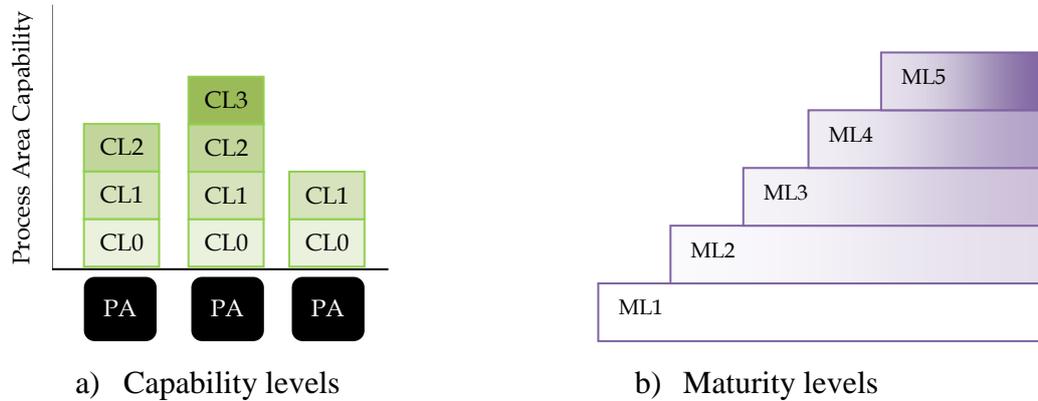


Figure 11 CMMI levels (CMMI institute)

An organization can apply a CMMI appraisal for the entire organization or to parts of it, for instance a division or group of projects. The appraisal states which level the organization (or part of it) has achieved. To reach a particular level, the organization has to satisfy all of the goals of the process area or set of process areas that are targeted for improvement, regardless of whether it is a capability or a maturity level. The four capability levels are numbered 0 through 3 (incomplete, preformed, managed, and defined). The five maturity levels are numbered from 1 to 5 (initial, managed, defined, quantitatively managed, and optimizing). (CMMI-DEV, V1.3 2010.)

**APPENDIX 2 COMMON ISSUE AREAS OF THE IT SERVICE  
QUALITY MEASUREMENT FRAMEWORK (LEPMETS, CA-  
TER-STEEL, GACENGA & RAS 2012)**

Table 8 Value of IT service

Measurement Category	Measure	Indicator
Mutual value creation	Value co-creation	Revenue growth
Value production	Waste	Non-value added activities
IT governance	Business/IT strategic alignment	IS audit results

Table 9 Information System quality

Measurement Category	Measure	Indicator
Functional correctness	Defects Security flaws and vulnerabilities	Defect density
Portability	Standards compliance	Interface compliance validation
Usability	Problems and errors	Number of preventive problems daily Number of incidents related to problems daily
Availability Reliability Maintainability	Time to restore	MTBSI- mean time between system incidents MTBF - mean time between failures MTRS - mean time to restore system Number of incidents resolved out of all incidents daily
Component capacity	Performance of technical components  Capacity of technical components	Number of system failures related to component performance Number of system failures related to component capacity
Scalability	Growth without business disturbance	Incidents related to the speed of growth
Adjustability	Complexity Business customization	System complexity System adjustability

Table 10 IT service quality

Measurement Category	Measure	Indicator
IT service availability	Maintainability	MTRS - mean time to restore IT service after failure
IT service continuity	Business Impact Analysis (BIA) measures  Management of risks (M_o_R)	Business impact on the loss of IT service (financial) Mean time to recovery Incidents related to IT service continuity Changes related to IT service continuity Business impact on service unavailability Business impact on service performance degradation Business impact on delayed solutions Number of identified risks and threats Weighted average of the impact of aggregated risks
IT service capacity	Capacity of operational services	Incidents related to IT service capacity Changes related to IT service capacity
IT service performance	Speed of information processing	Incidents related to IT service performance Changes related to IT service performance
IT service utilization	Service importance to business	Utilization rate of IT service functions
Information security	Confidentiality  Integrity  Availability	Incidents related to information confidentiality Changes related to information confidentiality Incidents related to information integrity Changes related to information integrity Incidents related to information availability Changes related to information availability
IT service reliability	Dependability	Incidents, RFCs and problems handled daily Mean time to achieve incident resolution
Monetary value of the IT service	Financial measures	Cost – actual cost for service provider to provide the service Price – actual price for customer paid for received services Accuracy of service operation function's forecast Competitiveness of service

Table 11 Performance of IT service management processes

Measurement Category	Measure	Indicator
Process compliance	Process audit findings Reference model rating Organizational compliance index	Process audit results Process assessment results
Process efficiency	Productivity	Historical vs. proposed and actual
Process effectiveness	Defect containment Rework	Requirements defects discovered after design phase Rework effort

Table 12 Customer satisfaction

Measurement Category	Measure	Indicator
Customer feedback	Survey results	Appearance of physical facilities, equipment, personnel and communication material IT service is provided dependably and accurately IT service provider is willing to help customers and provide prompt service IT service provider conveys trust and confidence IT service provider provides caring, individualized attention Perception of IT service stability Perception of IS quality Perception of IT service processes' performance
Customer support	Requests for support	Total calls per day answered, abandoned Average call response time Incidents handled daily by service desk

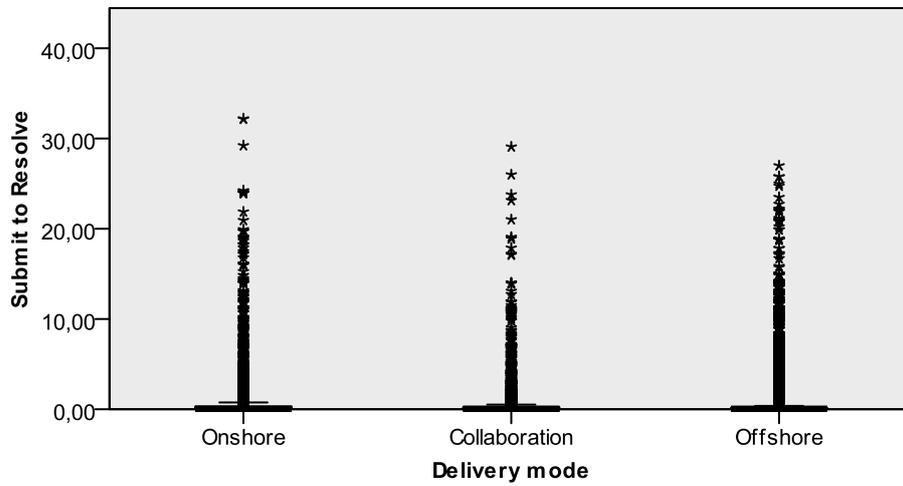
Table 13 Service behavior

Measurement Category	Measure	Indicator
IT service climate	IT service provider's employee survey results on: service leadership	<p>Work performance goals are regularly discussed with employees</p> <p>Employees know how the provided service contributes to better performance of the clients</p> <p>Best approach to serve clients are discussed regularly</p> <p>Emphases of daily work are on providing excellent service to clients</p>
	Service vision	<p>Effort is made by the service provider to be a respected partner to clients</p> <p>Being flexible when dealing with clients' perspectives</p>
	Service evaluation	<p>Frequent communication with clients</p> <p>Recognition and rewards given for providing excellent client service</p> <p>Evaluation of how clients were served was a part of the most recent personal performance review</p> <p>Customer service is an important criterion of formal performance evaluation</p>
Sustainability of a service system	Survey results	<p>Saturation and sustainability of resource quantity</p> <p>Resource quality – capability and reliability of resource (education level and experience)</p> <p>Resource sustainability to maintain certain level of quality</p>

### APPENDIX 3 IT CONSULTANCY COMPANIES' QUALITY REFERENCES

Company	Mentioned certifications	Other comments	Source
<b>Accenture</b>	CMMI	Client satisfaction	<a href="http://www.accenture.com/microsites/hpsv-seaport-e/qa-plan/Pages/default.aspx">http://www.accenture.com/microsites/hpsv-seaport-e/qa-plan/Pages/default.aspx</a>
<b>Capgemini</b>	CMMI ISO14001 ISO 20000 ISO 27001 ISO 9001	Client satisfaction	<a href="http://www.capgemini.com/public-sector/our-quality-assurance-program">http://www.capgemini.com/public-sector/our-quality-assurance-program</a>
<b>CGI</b>	CMMI ISO 9001 ISO 27001 ISO 20000	Client satisfaction	<a href="http://www.cgi.com/en/quality">http://www.cgi.com/en/quality</a>
<b>Fujitsu</b>	ISO 9001 ISO 14001 ISO 27001 ISO 20000		<a href="http://www.fujitsu.com/fi/english/about/quality/">http://www.fujitsu.com/fi/english/about/quality/</a>
<b>IBM</b>	CMMI ISO 9001:2000	Client satisfaction	<a href="https://www-304.ibm.com/easyaccess3/fileserv?contentid=104374">https://www-304.ibm.com/easyaccess3/fileserv?contentid=104374</a>
<b>Infosys</b>	CMMI ISO 9001-TickIT ISO 20000 ISO 27000 AS 9100 TL 9000 ISO 14001 eSCM Level 4		<a href="http://www.infosys.com/global-sourcing/global-delivery-model/Pages/quality.aspx">http://www.infosys.com/global-sourcing/global-delivery-model/Pages/quality.aspx</a>
<b>TCS</b>	CMMI ISO 9001: 2000 Six Sigma		<a href="http://www.tcs.com/about/corp_facts/Pages/default.aspx">http://www.tcs.com/about/corp_facts/Pages/default.aspx</a>
<b>Wipro</b>	ISO 14001 ISO 9001 Six Sigma		<a href="http://www.wipro.com/products/quality-benchmarks.aspx">http://www.wipro.com/products/quality-benchmarks.aspx</a>

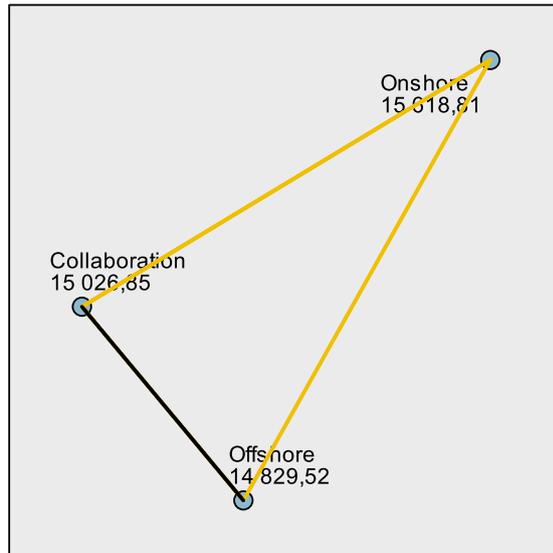
**APPENDIX 4 SPSS OUTPUT FROM THE QUANTITATIVE ANALYSIS**



<b>Total N</b>	29 986
<b>Test Statistic</b>	31,146
<b>Degrees of Freedom</b>	2
<b>Asymptotic Sig. (2-sided test)</b>	,000

1. The test statistic is adjusted for ties.

Figure 12 Independent-samples in Kruskal-Wallis test



Each node shows the sample average rank of Delivery mode.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Offshore-Collaboration	197,331	125,529	1,572	,116	,348
Offshore-Onshore	789,294	141,702	5,570	,000	,000
Collaboration-Onshore	591,963	167,179	3,541	,000	,001

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed. The significance level is ,05.

Figure 13 Pairwise comparison in Kruskal-Wallis test

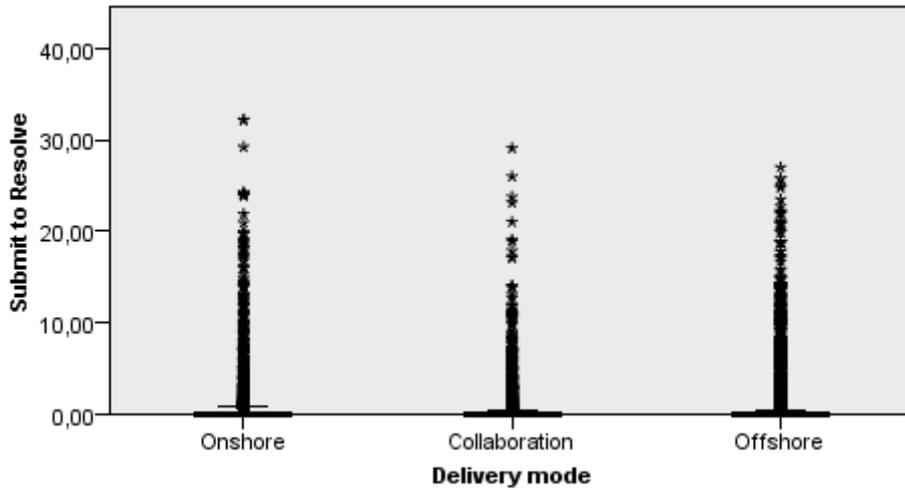
Delivery mode	N
Onshore	4644
Collaboration	6343
Offshore	18999
<b>Total</b>	<b>29986</b>

Kruskal-Wallis test effect size r			
Pairwise comparison	z	√N	r
Offshore-Collaboration	1,572	159,192	0,010
Offshore-Onshore	5,570	153,763	0,036
Collaboaration-Onshore	3,541	104,819	0,034

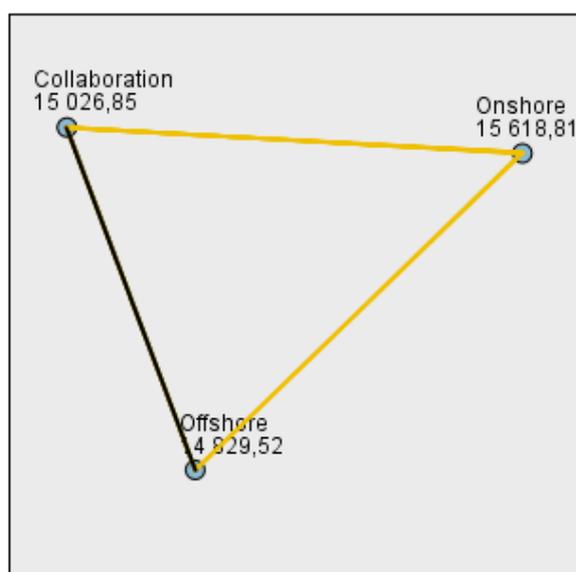
Jonckheere-Terpstra test effect size r			
	z	$\sqrt{N}$	r
Jonckheere-Terpstra test	-5,073	173,1647	-0,0293

Figure 14 Effect sizes



<b>Total N</b>	29 986
<b>Test Statistic</b>	115 342 184,000
<b>Standard Error</b>	740 676,425
<b>Standardized Test Statistic</b>	-5,073
<b>Asymptotic Sig. (2-sided test)</b>	,000

Figure 15 Independent-samples in Jonckheere-Terpstra test



Each node shows the sample average rank of Delivery mode.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Offshore-Collaboration	59 402 012,000	504 488,309	-1,691	,045	,136
Offshore-Onshore	41 853 507,500	416 947,448	-5,426	,000	,000
Collaboration-Onshore	14 086 664,500	164 233,652	-3,908	,000	,000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significances (1-sided tests) are displayed. The significance level is ,05.

Figure 16 Pairwise comparison in Jonckheere-Terpstra test

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Fix progress * Delivery mode	29986	100,0%	0	0,0%	29986	100,0%

**Fix progress \* Delivery mode Crosstabulation**

			Delivery mode			Total
			Onshore	Collaboration	Offshore	
Fix progress	Met	Count	4465	6154	18822	29441
		% within Delivery mode	96,1%	97,0%	99,1%	98,2%
	Missed	Count	179	189	177	545
		% within Delivery mode	3,9%	3,0%	0,9%	1,8%
Total		Count	4644	6343	18999	29986
		% within Delivery mode	100,0%	100,0%	100,0%	100,0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	239,539 <sup>a</sup>	2	,000
Likelihood Ratio	223,780	2	,000
N of Valid Cases	29986		

a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 84,41.

Figure 17 Fix progress cross tabulations

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Response progres * Delivery mode	26477	100,0%	0	0,0%	26477	100,0%

**Response progres ^ Delivery mode Crosstabulation**

			Delivery mode			Total
			Onshore	Collaboration	Offshore	
Response progres	Met	Count	3404	5084	16969	25457
		% within Delivery mode	95,4%	91,8%	97,7%	96,1%
	Missed	Count	163	457	400	1020
		% within Delivery mode	4,6%	8,2%	2,3%	3,9%
Total		Count	3567	5541	17369	26477
		% within Delivery mode	100,0%	100,0%	100,0%	100,0%

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	406,520 <sup>a</sup>	2	,000
Likelihood Ratio	355,633	2	,000
N of Valid Cases	26477		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 137,42.

Figure 18 Response progress cross tabulations