Industrial Management & Data Systems

Effects of outsourced service providers' experiences on perceived service quality: A signaling theory framework

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Received 13 January 2016
Revised 29 March 2016
Accepted 2 May 2016

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Abstract

Purpose – The purpose of this paper is to propose a framework to examine experiences of an information technology/information systems (IS) outsourcing service supplier as a signal of perceived service quality and to consider the moderating effects of information asymmetries and signal credibility.

Design/methodology/approach – Drawing on signaling theory, the paper integrates past experiences of an outsourcing service supplier, information asymmetries, signal credibility, perceived service quality, and purchase intention into a model. Questionnaires were collected in Taiwan, and partial least-squares technique was employed to test the model.

Findings – The results indicate that past experiences of an IS outsourcing supplier affect perceived service quality, which subsequently influences positively the intention to purchase IS outsourcing services. In addition, signal credibility moderates the relationship between the provider's past experiences and perceived service quality, though information asymmetries do not have significant effect on the hypothesized moderating relationship.

Originality/value – This research enriches the extant literatures in signaling theory by demonstrating the few-mentioned IS outsourced suppliers' experiences as a quality signal as well as in outsourcing contexts with signaling perspectives. The empirical findings validate the importance of dissemination and investment of past experiences for IS provider companies and give a cue of utilizing providers' experiences to alleviate uncertainty when assessing IS service quality and purchasing outsourcing services for client companies.

Keywords Service quality, Signalling theory, Information asymmetry, Signal credibility, Suppliers' experience

Paper type Research paper

1. Introduction

Since the past few years, with the development of technology and changing corporate needs, companies have been investing increasing manpower, money, and other resources in information system (IS) development and in the application of information technology (IT). According to Gartner Forecast (2015), global enterprise IT spending across all industry market segments would grow 2.0 percent in 2015 to $2.786 trillion. In addition, the worldwide IT services market would grow 3.7 percent to nearly $942 billion in 2015. With outsourcing contributing more than half of this market growth, the market will reach $1.1 trillion in 2019. The Deloitte Consulting LLP Report (2014) also noted that IT outsourcing (ITO) drove more than 60 percent of the total sourcing market. Therefore, ITO is a crucial trend in business, especially through the help of external expertise to reduce costs and focus on core business, and thus cope with the fierce competition in the market today (Lacity *et al.*, 2010).

Furthermore, enterprises have also realized that IT/IS utilizations have become one of the most important approaches to increase efficiency and effectiveness and improve

Industrial Management & Data Systems
Vol. 116 No. 8, 2016
pp. 1656-1677

0263-5577
DOI 10.1108/IMDS-01-2016-0015

competitiveness (Cross, 1995). Improved productivity, higher quality, immediate responses to the market, and the ability to focus on core areas are the major benefits of outsourcing (Low and Chen, 2012; Dhar and Balakrishnan, 2006). The appropriate selection of an outsourced IT/IS service provider facilitates the achievement of these benefits and significantly affects the performance of client enterprises (Agrawal *et al.*, 2006). However, due to unfamiliarity with outsourcing service providers (e.g. competence, experience, and services), particularly for the first time, there are many risks and uncertainties (Dhar and Balakrishnan, 2006; Lacity *et al.*, 2009). Even though the client companies have outsourced before, the professional services market is constantly changing, with new technologies/consultancies being established and others being taken over or folding, which makes the purchase of outsourcing services almost always a "new buy" (Mitchell, 1994). Specifically, the service agreement from an outsourcing provider is usually a long-term contract (Schneider and Sunyaev, 2016; Chang *et al.*, 2012), which results in significant long-term influence. Such service agreements can have great effect if they are not designed carefully and governed effectively.

Several studies (Park and Kim, 2005; Michell and Fitzgerald, 1997; Grover *et al.*, 1996) have shown that one of the major problems with IT/IS outsourcing involves service quality. Changes in outsourcing service quality may turn into disputes that result in contract renegotiation or even changing service providers, thereby causing loss of time and money, which subsequently affects the performance of a client company (Aubert *et al.*, 2012; Michell and Fitzgerald, 1997). In fact, commitment to quality is the most important factor when selecting vendors (Ma *et al.*, 2005). Therefore, prior to purchase, understanding the service quality of outsourcing service providers may avoid wasting resources (e.g. time and human power) and may facilitate the success of outsourcing (Grover *et al.*, 1996).

Signaling theory is essentially related to reducing the information asymmetry between two parties (Spence, 2002). A signal is a cue that a seller can use to convey information credibly about unobservable product quality (Rao *et al.*, 1999). Thus, business-to-business research and practice may be informed by drawing on signaling theory to explore how cues such as IT/IS outsourcing service providers' past experiences can be used to signal service quality when the client company is unfamiliar with these providers. Signaling theory has been used to recognize the signals (i.e. cues) that customers use to appraise quality when faced with limited information (Kirmani and Rao, 2000). The reputation of a seller has empirically been found to signal the quality of products in a manufacturing context (Chu and Chu, 1994), as have premium prices in an online-auction market (Ba and Pavlou, 2002). However, past experiences of an outsourcing service provider have not been framed theoretically or investigated as a service quality signal. Therefore, this study proposes the following questions:

(1) Do past experiences of IT/IS outsourcing service providers provide an effective service quality signal in a business-to-business context prior to purchase?

Based on the qualifying conditions of signaling theory (Wells *et al.*, 2011), this study further examines the following:

(2) How do information asymmetries and signal credibility affect the relationship between the signal (i.e. past experiences of providers) and perceived service quality as well as subsequent purchase intentions?

The remainder of this paper is organized as follows. The authors first provide a literature review of signaling theory, service quality, and related signals and then form

a framework to depict past experiences of outsourcing service providers as a signal of perceived service quality. This framework reflects the moderating effects of information asymmetries and signal credibility, which affect purchase intentions. In our field study, ongoing cases of discussion of IS requirements between a client company and a service provider in Taiwan prior to a purchase decision are surveyed. The paper concludes with a discussion, theory and practice implications, and future research.

2. Literature review and hypothesis

2.1 Signaling theory

Signaling theory involves three primary elements, i.e., the signaler, the receiver, and the signal itself (Connelly *et al.*, 2011), where signalers (insiders) own information about an individual (Spence, 1973), product (Kirmani and Rao, 2000), or organization (Ross, 1977), which is turned into signals (cues) that are transmitted to receivers (outsiders). In 1973, Spence presented how a job applicant can engage in behaviors in labor markets to reduce information asymmetries. Since then, signaling theory has been fundamentally concerned with reducing information asymmetries between two parties. In fact, signaling theory has been used extensively in domains such as finance (Zhang and Wiersema, 2009) and marketing (Rao *et al.*, 1999) as a framework for understanding how two parties (e.g. a buyer and seller) address limited or hidden information in a pre-contractual (pre-purchase) context (Wells *et al.*, 2011). In addition, signaling theory is employed in entrepreneurship literature to examine the signaling value of a founder inclusion (Busenitz *et al.*, 2005), venture capitalist, and angel investor presence (Elitzur and Gavious, 2003).

Signals are distinguished where extrinsic signals (Richardson *et al.*, 1994), which are not inherent to the product being evaluated (e.g. retail reputation, Chu and Chu, 1994; and warranties, Boulding and Kirmani, 1993), are used more commonly and are more influential than intrinsic signals (i.e. product attributes), especially when extrinsic cues are more readily available or easily understood (Zeithaml, 1988). For instance, studies (Jha *et al.*, 2013; Gurhan-Canli and Batra, 2004) have shown the relevance and importance of corporate image as a signal of unobservable quality.

In addition, information asymmetries occur when different people have different kinds of information (Stiglitz, 2002). Some information is privately owned or not readily apparent, which causes information asymmetries between those who have the information and those who could make better decisions if they had it. Similarly, when a client company has decided to outsource its IT/IS functions, it usually surveys outsourcing service providers to prepare a list of initial candidate vendors based on, for example, the reputation, industrial knowledge, and experiences of the service providers (Chaudhury *et al.*, 1995). However, the insights regarding these criteria are limited; therefore, gaps (information asymmetries) are present. For economic, management, and entrepreneurship disciplines, the profundity of signaling theory ascribes costs to information acquisition processes that resolve information asymmetries (Connelly *et al.*, 2011).

Signal theory has been widely applied in various fields to explain choice phenomena. In marketing, signals can be shown by delivering information about seller characteristics to buyers to examine and appraise the validity and credibility of a seller's qualities, and the costs of deceptively making up a signal must exceed the benefits of faking it (Mavlanova *et al.*, 2012). In addition, for companies, systematic approaches for formulating an effective signal can help reduce information asymmetries for their customers and can provide a strong competitive edge (Bloom and Reve, 1990). The desired goal of signaling primarily focusses on positive information communication

to deliver the positive attributes of product quality, service quality, or organization function to facilitate purchase intentions, investment, etc. (Wells *et al.*, 2011).

2.2 Service quality

From the late 1970s to the 1980s, the issue of service quality has been examined extensively (Parasuraman *et al.*, 1985; Gronroos, 1984). Quality itself has many different definitions and has been discussed primarily for physical products (Garvin, 1987). Studies have shown the strategic benefits of quality in market share and return on investment (Anderson and Zeithaml, 1984) and in lowering manufacturing costs and improving productivity (Garvin, 1983). Perceived quality varies for each person, which affects quality evaluation, especially in the service sector. With the well-documented characteristics of services, i.e., intangibility, heterogeneity, and inseparability, the evaluation of service quality is made using the outcome and the process of service delivery (Gronroos, 1984). Parasuraman *et al.* (1985) have drawn up five gap models and revealed ten dimensions that consumers use in forming expectations and perceptions of services. Then, they created a foundation for evaluating service quality and recast these ten dimensions into five most critical dimensions, i.e., tangibles, reliability, responsiveness, assurance, and empathy. This is known as the SERVQUAL instrument, which has 22-question items (Parasuraman *et al.*, 1988).

The SERVQUAL instrument has been applied as a foundation for measuring integrated service quality in many different industries. However, it has caused many controversies relative to methodological, analytical, conceptual, and practical issues related to the perceptions of service quality and SERVQUAL (Landrum *et al.*, 2007; Babakus and Boller, 1992; Cronin and Taylor, 1992). Based on such disputes, some authors have proposed modifications to the original SERVQUAL or developed industry-oriented models, such as HOLSERV in hospitality (Mei *et al.*, 1999), with 27-question items, and SERVPERF (Cronin and Taylor, 1992), with a performance-only scale.

Nevertheless, as a diagnostic tool for IS service quality, SERVQUAL has also gathered significant managerial and practical attention. SERVQUAL has been adapted to the measurement of service delivery, including IS service delivery (Kettinger and Lee, 2005). Similarly, considerable dispute and subsequent research that questioned the predictive superiority of SERVQUAL's difference measure (the perceived service quality−expected service quality) have occurred in both marketing and IS (Kettinger and Lee, 2005). Many studies (Parasuraman *et al.*, 1994; Cronin and Taylor, 1992; Babakus and Boller, 1992) have revealed that the perceived performance-based (SERVPERF) service quality measurement has better predictive validity than the original difference scored SERVQUAL scale. In fact, the power of predictive superiority of the performance-only scores from IS academic work (Van Dyke *et al.*, 1999; Kettinger and Lee, 1997) has also been confirmed. Therefore, this perspective forms the basis for the current research that aims to predict and evaluate service quality of an IS outsourcing provider prior to contracting. In addition, for data collection efficiency, ease of application, and the possibility of obtaining a total service quality score for IS outsourcing service provider candidates prior to purchase, a direct perceptual 13-item IS-adapted SERVQUAL instrument is employed (Park and Kim, 2005; Kettinger and Lee, 1997).

Service quality delivered by outsourcing suppliers is an important factor of IT/IS outsourcing success (Liang *et al.*, 2016; Su and Levina, 2011; Dibbern *et al.*, 2004). Accordingly, Su and Levina (2011) suggested that increasing the breadth and depth of the outsourcing supply base is beneficial to service quality improvement when dealing

with outsourcing plans at a very early step. Gorla and Somers (2014) proposed and examined empirically the relations between the extent of outsourcing and perceived service quality as well as between perceived service quality, user satisfaction, and perceived usefulness using a perceived service model, a service adequacy model, and a service superiority model in an IT/IS outsourcing context. However, not all relations among these models were significant. They noted the importance and differences among the perceived service, desired service, and adequate service in the IS service quality context. Furthermore, some studies (Park *et al.*, 2012; Pomirleanu *et al.*, 2016) have quoted from the literature and demonstrated that service quality, as experienced by a client, is composed of two dimensions: technical quality and functional quality, which can be conceptualized as the "what" and "how" of the service offering. Park *et al.* (2012) tested the dual structure of service quality in their proposed relationship commitment model in the IT services setting and found that functional, rather than technical, service quality is a stronger mediator in forming client trust, which has, in turn, a significant effect on relationship commitment. Deng *et al.* (2013) compared the marginal contributions of a vendor's different types of capabilities to offshore IS outsourcing relational performance and revealed that client-specific capabilities play a crucial role in relational service quality. They also suggested that vendors can achieve service quality improvement by investing in human resource capabilities to accumulate client-specific capabilities. Specific suggestions include the following: recruiting veterans who are experienced in dealing with clients and familiar with the client's domain knowledge, business routines, and organization culture, or recruiting people who have work or education experience in the client's country, or undertaking more projects from a given client to gain experience.

2.3 Past experiences of suppliers

IT/IS outsourcing is the delegation of the continuous management of an IT/IS service to a third party, ranging from consultancy to hardware retailing, including related activities such as planning, project management, system integration, design, application development, implementation, operations, maintenance, and infrastructure provision, under a contract that includes a service-level agreement (Michell and Fitzgerald, 1997). Relative to the consultancy-based characteristics of IT/IS outsourcing suppliers, outsourcing can be considered a professional service (Stock and Zinszer, 1987). In this setting, some researchers have found that past experiences are the most important criterion in the selection of a supplier when considering quality evaluation (Stock and Zinszer, 1987). In addition, Gable (1996) showed empirically that a consulting company's experiences are one of the three highest priority criteria for both clients and consultants to achieve satisfaction, improvement, and performance when outsourcing IT advice. In addition, Smith and Kumar (2004) proposed a comprehensive theory for an application service provider (a type of IS outsourcing offering related hardware, software, telecommunications, and consulting necessary to deploy, run, and maintain hosted applications remotely) and compared research into related IS outsourcing practices. They suggested the importance of experiences with similar-sized clients and testimonies of success as conditions for service vendor selection, which subsequently influence the assessment of the IS quality of a client company.

Experience and expertise (or professional competence) are closely related within the IT context, and expertise is the most relevant component of experience (Thompson *et al.*, 1994). Bahli and Rivard (2005) indicated that expertise is normally defined in relation to task-specific domains (e.g. IT) and is seen as being acquired on the basis of

experience in these domains. Thus, based on this connection, some researchers found the effect of experience on utilization of PCs (Thompson *et al.*, 1994) and on the performance of problem-solving groups (Littlepage *et al.*, 1997). Furthermore, service provider expertise has been considered a crucial factor for vendor selection or service quality evaluation (Schneider and Sunyaev, 2016; Michell and Fitzgerald, 1997). In fact, studies have shown that in addition to reputation, prior experiences are the most important criterion in professionalism dimensions (Low and Chen, 2012). However, few studies empirically demonstrated that experiences are cues that affect perceived service quality, in particular from a signaling perspective. Accordingly, we expect that experiences of an IS outsourcing supplier will influence client perceptions of service quality. Thus, we propose the following hypothesis:

H1. Past experiences of an IS outsourcing supplier positively affect client perceptions of service quality.

2.4 Information asymmetries and signal credibility

Information asymmetries can be depicted by pre-purchase information scarcity and post-purchase information clarity, which are qualifying conditions of signaling theory (Wells *et al.*, 2011; Kirmani and Rao, 2000). Differences between scarcity and clarity depend on the nature of the product or service and the experience of the consumer (Wells *et al.*, 2011). In information economics, for different types of goods, information asymmetries can be categorized in relation to experience, credence, and search (Darby and Karni, 1973; Nelson, 1970). Experience qualities can be discovered only after purchase because the product has been used, for example, the taste of canned tuna (Nelson, 1970). In other words, using the product generates post-purchase information clarity that enables consumers to evaluate quality. In contrast, credence qualities cannot be evaluated through normal use, are associated with expensive goods, and are difficult to judge even after purchase (Darby and Karni, 1973), for example, the claimed advantages of removal of the appendix and certain automobile repairs. Search qualities can be ascertained in the search process prior to purchase, for example, trying on a dress (Nelson, 1970). As the intrinsic attributes of the product or service are not easy to perceive prior to purchase, extrinsic signals of the product or service tend to be more important. Post-purchase clarity enables consumers to determine if the signals predict product or service quality accurately; therefore, signaling theory is most applicable to experience qualities (Wells *et al.*, 2011).

Prior to purchase, there are existing information asymmetries between a client and outsourcing supplier companies, which make supplier service quality assessment difficult. This is particularly true for first-time clients. To address this problem, a client company can depend on the supplier's intrinsic and extrinsic attributes (i.e. signals) (Richardson *et al.*, 1994; Zeithaml, 1988). Broad or high-information asymmetries (i.e. less supplier service quality information) imply that a client is uncertain about service quality; therefore, signals will greatly affect service quality perceptions. Narrow or low-information asymmetries (i.e. more supplier service quality information) imply that a client is well positioned to assess service quality; thus, signals will have limited effect on perceptions of service quality (Wells *et al.*, 2011). Accordingly, we offer the following hypothesis:

H2. Information asymmetries moderate the influence of past experiences of an IS outsourcing supplier on client perception of service quality.

Signal credibility is another qualifying condition for the application of signaling, i.e., to have a positive effect on product or service quality, a consumer must perceive a signal as credible (Wells *et al.*, 2011). The wealth or asset, often referred to as a bond, which indicates that the signal is credible, will be lost by sending a false signal. Signal credibility occurs when consumers believe that the vendor has made considerable investment by providing a signal and that the investment would suffer if the signal is not true. Therefore, if a signal is perceived as credible, consumers can distinguish between high- and low-quality companies. In information economics, this is referred to as a separating equilibrium (Connelly *et al.*, 2011; Boulding and Kirmani, 1993).

If an outsourcing supplier has declared past experiences as a signal, credibility would be determined by whether client firms perceive that the experience and maintenance of past experiences requires considerable expense and that future sales are at risk if service quality is poor. Thus, as a credible signal, the past experiences of an IS outsourcing supplier should separate high- and low-quality vendors. Furthermore, signaling studies have suggested the moderating effect of signal credibility, i.e., a more credible signal may have more significant effect on product or service quality than a less credible signal (Wells *et al.*, 2011; Boulding and Kirmani, 1993). In other words, the strength of the relationship between past experiences of an outsourcing supplier and the perceived service quality increases with the perceived credibility of the past experience signal. Accordingly, the following hypothesis is proposed:

H3. Signal credibility moderates the influence of past experiences of an IS outsourcing supplier on the client perception of service quality.

2.5 Perceived service quality and purchase intentions

The theory of reasoned action (TRA) (Ajzen and Fishbein, 1980), an attitude-behavior model, appears to predict consumer intentions and behavior quite well and provides a relatively simple basis for identifying where and how to target attempts to change consumer behavior (Sheppard *et al.*, 1988). The theory of planned behavior (TPB) (Ajzen, 1991) is also widely used to predict behaviors in marketing, management, psychology, and even education. In addition to subjective norms and attitudes, TPB includes perceived behavioral control to influence intention and in turn influence behavior (Ajzen, 1985). In our study, the client company first provides the information about IS outsourcing requirements to the service provider candidates, including the scope, functions, specifications, and budget. These candidates then propose an action plan for the IS outsourcing according to the requirements. The client company's staff analyzes, compares, and assesses the major dimensions of these proposals to evaluate the suppliers. In this setting, individual behavior is under control. Thus, TRA seems very reasonable for this study. The TRA suggests that a person's attitude will affect behavioral intention, which in turn affects actual behavior. Some researchers have noted that perceived service quality can be a form of attitude and a long-run overall evaluation (Cronin and Taylor, 1992; Parasuraman *et al.*, 1988). Kettinger *et al.* (2009) proposed a conceptual model in which service quality leads to behavioral intention and empirically showed the relationship, which is mediated by service value and satisfaction, between service quality and intention to reuse an IS service. Gounaris *et al.* (2010) demonstrated that in an e-commerce context, service quality has positive direct and indirect effects on consumer behavioral intentions, i.e., site revisit, word-of-mouth communication, and repeat purchase. In addition, several studies have revealed trust,

risk, and usefulness as critical factors that influence online purchase intention (Van der Heijden *et al.*, 2003; McKnight *et al.*, 2002). An opportunity exists to examine the causal link between perceived service quality and behavioral intention to purchase an outsourcing service and to better understand how the past experiences of IS outsourcing supplier signals can eventually affect purchase intentions. Therefore, this study offers the following hypothesis:

H4. Perceived service quality will positively affect client intention to purchase an IS outsourcing service.

In summary, given the information asymmetries associated with IS outsourcing, this research proposes that past experiences of an IS outsourcing supplier act as a signal of perceived service quality, as shown in Figure 1. The research methodology and the hypothesized relationships are discussed in the following sections.

3. Research methodology

3.1 Research measures and questionnaire design

Multi-item scales were adapted from the literature and used to measure the following five constructs: past experiences of a supplier, information asymmetries, signal credibility, perceived service quality, and intention to purchase IS outsourcing services. The original scale items were modified slightly to suit the current research context and environment. All scale items are listed in Appendix.

The research was conducted in Taiwan. To ensure translation equivalence, the questionnaire was designed in English, translated into Chinese, and then back-translated to English by a second translator. The original and back-translated versions were compared for conceptual equivalence and translation errors and were refined where necessary. Then, to ensure face validity, the survey was pretested with five IT/IS researchers and five IT/IS practitioners from client firms and IS outsourcing providers, who were all familiar with IS outsourcing. The final version was further refined based on comments from the pretest participants. A seven-point Likert scale (strongly disagree = 1 to strongly agree = 7) was used for all items.

3.2 Data collection

Empirical data for this research was collected from large companies located is various industrial parks and export processing zones. We made an initial telephone call to 1,000 target companies to determine if the company was developing an IS outsourcing plan.

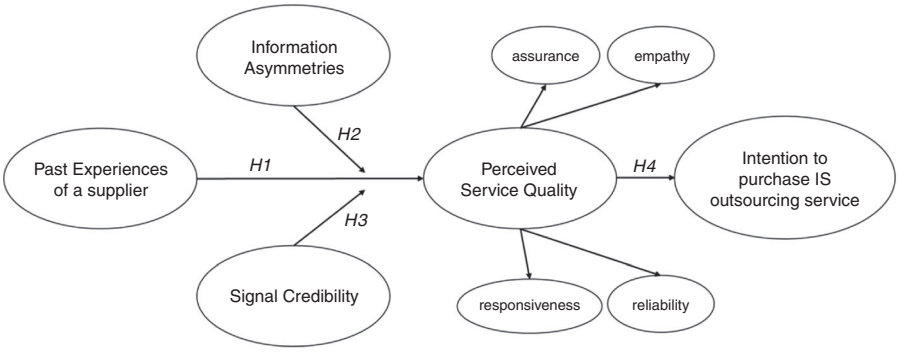


Figure 1.
Research model

If the company was discussing outsourcing, we explained our research plan and asked if they would be willing to participate. An online survey was developed and implemented to collect the data. Online surveys are cost-effective and enable fast response time (Bhattacherjee, 2001). Contacts who were employed in IT/IS departments and involved in making outsourcing purchasing decisions received an e-mail that contained a hyperlink to the survey and described the topic and importance of the survey. The questionnaire was attached to the e-mail to facilitate participants who did not want to complete it online. Participants were asked to focus on the most recent outsourcing provider candidates if more than one supplier had been evaluated. The survey was administered to 469 participants. A follow-up e-mail was sent after two weeks to remind them to respond. 115 responses were collected (24.5 percent response rate); three surveys were discarded due to missing data.

3.3 Nonresponse bias

Potential nonresponse bias was controlled by following Armstrong and Overton's (1977) suggestion. They suggested that late respondents are more likely to be similar to nonrespondents than early respondents. In this study, there were 71 early respondents and 41 late respondents. By comparing the age and work experience of early respondents to late respondent using a χ^2 test (Shiau and Luo, 2012), it was found that the groups did not differ statistically ($p > 0.05$), indicating an absence of nonresponse bias.

4. Data analysis results

The partial least-squares (PLS) approach (SmartPLS 3) (Ringle *et al.*, 2015) was employed to test the proposed research model. PLS is more suitable for small samples compared to covariance-based structural equation modeling techniques (Chin *et al.*, 2003). PLS is also more advisable when analyzing continuous scale moderators (Jain *et al.*, 2014; Chin *et al.*, 2003) because two moderators using continuous scales were measured (i.e. information asymmetries and signal credibility). In addition, PLS, unlike LISREL, for example, does not require assumptions concerning indicator distribution in the data (Fornell and Bookstein, 1982). Bootstrapping was employed to assess the statistical significance of the parameter estimates using 5,000 resamples (Hair *et al.*, 2012).

4.1 Sample characteristics

In the 112 responses used for analysis, most respondents (45.5 percent) were 40-49 years old and 78.6 percent had more than ten years of experience. Regarding job titles, 45.5 percent were engineers/system analysts/specialists, 25.9 percent were team leaders/chiefs/supervisors, and 25 percent were managers/officers/directors. Totally, 71.4 percent of the firms surveyed were in the manufacturing sector. Most firms had more than 200 employees (62.5 percent); 32.1 percent had at least 11 employees in the IT/IS department. Respondent demographics are shown in Table I.

4.2 Common method bias (CMB)

To ensure that common method bias did not influence the interpretation of results, we added a common method factor to assess the potential CMB (Liang *et al.*, 2007). The results showed that the average substantive variance of the indicators is 0.779, and the average method-based variance is 0.031 (the analysis table is available from

Measure	Items	Frequency	%
Age	20-29 years old	3	2.7
	30-39 years old	48	42.9
	40-49 years old	51	45.5
	⩾50 years old	10	8.9
Years of work experience	1-3 years	3	2.7
	4-6 years	11	9.8
	7-9 years	10	8.9
	⩾10 years	88	78.6
Job title	Engineer/system analyst, system designer/specialist	51	45.5
	Team leader/chief/supervisor	29	25.9
	Manager/officer/director	28	25
	General manager/president/CIO, CEO	4	3.6
Industry	Manufacturing	80	71.4
	Services (hotel, transportation, banking)	10	8.9
	Information and communication	9	8
	Commerce	5	4.5
	Public administration	5	4.5
	Construction	3	2.7
No. of employees	<30	4	3.6
	30-100	15	13.4
	101-200	23	20.5
	201-500	20	17.9
	⩾501	50	44.6
No. of IT/IS staff	1	19	17
	2-5	40	35.7
	6-10	17	15.2
	11-20	11	9.8
	⩾21	25	22.3

Note: $n = 112$

Table I.
Sample demographic characteristics

the authors on request). The ratio of substantive variance to method variance is approximately 25:1. Based on the small method variance, CMB is not a significant problem in this study (Liang *et al.*, 2007).

4.3 Measurement model

In this study, the PLS model included a measurement model (measurement items are described in Appendix) and a structural model that consisted of path coefficients and the coefficient of determination (R^2).

Assessment of a measurement model should examine individual item reliability, convergent validity, and discriminate validity (Hulland, 1999). Individual item reliability is evaluated by examining item loading and corresponding item constructs. Here, the minimum item loading is 0.7 (Henseler *et al.*, 2009). As can be seen in Table II, the load factor for all items exceeds 0.7, which indicates individual item reliability. Convergent validity was examined in two ways: composite reliability (CR), which should have a minimum value of 0.7 (Henseler *et al.*, 2009), and average variance extracted (AVE), which should have a value greater than 0.5 (Henseler *et al.*, 2009). The CR and AVE values in this study (Table II) exceed the threshold, which indicates convergent validity.

Construct	Item	Loading	Cronbach's α	Composite reliability (CR)	Average variance extracted (AVE)
Information asymmetries	ai1	0.833	0.742	0.844	0.643
	ai2	0.794			
	ai3	0.778			
Past experiences of a supplier	exp1	0.751	0.850	0.899	0.690
	exp2	0.861			
	exp3	0.850			
	exp4	0.854			
Intention to purchase IS outsourcing service	pi1	0.952	0.963	0.976	0.932
	pi2	0.964			
	pi3	0.980			
Signal credibility	sc-e1	0.922	0.851	0.910	0.771
	sc-e2	0.877			
	sc-e3	0.832			
PSQ – assurance	sq-assur1	0.889	0.854	0.912	0.774
	sq-assur2	0.872			
	sq-assur3	0.879			
PSQ – empathy	sq-empat1	0.864	0.903	0.932	0.774
	sq-empat2	0.843			
	sq-empat3	0.911			
	sq-empat4	0.900			
PSQ – reliability	sq-reli1	0.944	0.923	0.951	0.867
	sq-reli2	0.907			
	sq-reli3	0.942			
PSQ – responsiveness	sq-respon1	0.906	0.865	0.918	0.788
	sq-respon2	0.868			
	sq-respon3	0.888			

Note: All item loading values are significant ($p < 0.001$)

Table II.
Item loading, composite reliability, and average variance extracted (AVE)

Discriminate validity is examined to determine the correlations between latent variables and other constructs in measurement model analysis. Two measures of discriminant validity have been suggested (Henseler *et al.*, 2009), i.e., the Fornell-Larcker criterion and cross-loadings. The first criterion (Fornell and Larcker, 1981) postulates that the square root of the AVE of each construct should be greater than its correlations with all other constructs. Table III presents the correlation matrix. The diagonal values (square root of

Constructs	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intention to purchase (1)	*0.965*							
Past experiences of a supplier (2)	0.715	*0.830*						
Information asymmetries (3)	0.570	0.646	*0.802*					
PSQ – assurance (4)	0.655	0.674	0.586	*0.880*				
PSQ – empathy (5)	0.604	0.646	0.567	0.805	*0.880*			
PSQ – reliability (6)	0.568	0.631	0.528	0.810	0.761	*0.931*		
PSQ – responsiveness (7)	0.637	0.683	0.547	0.868	0.813	0.828	*0.888*	
Signal credibility (8)	0.246	0.336	0.392	0.344	0.385	0.291	0.327	*0.878*

Notes: Diagonal values (in italic) are the square root of the AVE for each construct. Off-diagonal elements are the correlations between the constructs

Table III.
Correlations of the latent variables for first-order constructs

the AVE for each construct) are greater than the off-diagonal values (correlations between different constructs) in the corresponding rows and columns, thus satisfying the first criterion. The second criterion requires that the loading of each indicator should be greater with its respective construct than with another construct (Henseler *et al.*, 2009). In this study, all indicators have their highest loadings on their respective constructs (the loading table is available from the authors on request). Together with the first criterion, this provides evidence for discriminate validity.

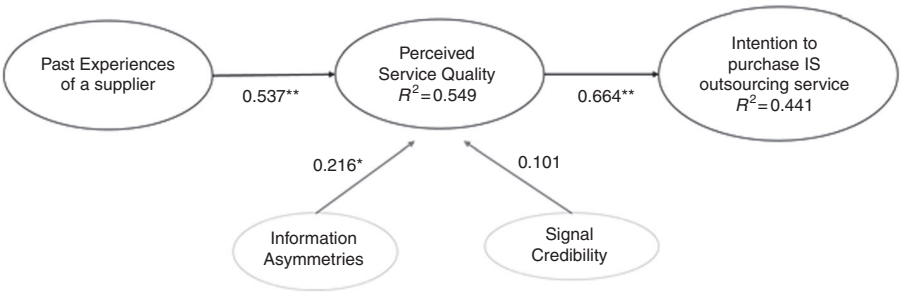
4.4 Structural model

The path coefficients of the structural model and significance of *H1* and *H4* were tested. Information asymmetries and signal credibility were included in the model to evaluate construct validity but not for hypotheses testing because these two variables were operated and tested for hypothesized interactions later. The explained variance (R^2) of each dependent construct was calculated. The results are shown in Figure 2. Past experiences of suppliers had significant effect on perceived service quality ($p < 0.001$), supporting *H1*, and the perceived service quality had a significant effect on intention to purchase IS outsourcing services ($p < 0.001$), supporting *H4*. Information asymmetries had significant effect on perceived service quality ($p < 0.05$), representing that more information can be acquired to examine service quality (overall mean of 5.66 on a seven-point scale) and was viewed as a credible signal. Signal credibility had no significant influence on perceived service quality.

In addition, past experiences of a supplier and information asymmetries explain a considerable amount of variance in the perceived service quality with an R^2 value of 0.549. Perceived service quality also explains a substantial amount of variance in the intent to purchase IS outsourcing services, with an R^2 value of 0.441. According to Chin (1998), R^2 values of 0.67, 0.33, and 0.19 in PLS models are substantial, moderate, and weak, respectively. Therefore, in this study, the R^2 values of the structural model are moderate to substantial and at acceptable levels (Henseler *et al.*, 2009). Furthermore, the predictive relevance of the structural model was examined using the Stone-Geisser value (Q^2) (Fornell and Bookstein, 1982). All Q^2 values are larger than 0, revealing predictive relevance of the structural model (Henseler *et al.*, 2009).

4.5 Moderating effects testing

This study assessed the moderating effect of information asymmetries and signal credibility on the positive relationship between past experiences of a supplier and perceived service quality (positive coefficient). The analysis was executed by individually



Notes: *p<0.05; **p<0.001

Figure 2.
Structural model

adding the interaction terms to the main effects model. Similarly, a bootstrapping resampling of 5,000 was employed to examine the level of significance for the hypothesized relationships (Hair *et al.*, 2012). First, considering information asymmetries, the results showed that past experiences of a supplier had significant effect on perceived service quality ($p < 0.001$), supporting *H1*, and the perceived service quality had significant effect on intention to purchase IS outsourcing services ($p < 0.001$), supporting *H4*. However, the moderating effect of information asymmetries was not significant ($p > 0.05$), which does not support *H2*. Next, examining signal credibility, the results revealed that past experiences of a supplier had significant effect on perceived service quality ($p < 0.001$), supporting *H1*, and the perceived service quality had significant effect on intention to purchase IS outsourcing services ($p < 0.001$), supporting *H4*. In addition, the moderating effect of signal credibility was significant ($p < 0.05$), supporting *H3*, which shows the influence of moderation.

5. Discussion

5.1 Results interpretation

The purpose of this research is to assess the relationship between past experiences of an IS outsourcing supplier, perceived service quality, and the intention to purchase an outsourcing service as well as the moderating effect of information asymmetries and signal credibility on the relationship between the provider's past experiences and perceived service quality. The results indicate that past experiences of an IS outsourcing supplier affects perceived service quality positively and, in turn, perceived service quality positively influences the intention to purchase IS outsourcing services. In addition, signal credibility moderates the relationship between the provider's past experiences and perceived service quality. This implies that past experiences are viewed as a significant investment and credible signals. Conversely, information asymmetries do not have significant effect on the hypothesized moderating relationship.

In fact, the amount of past experience of an IS outsourcing supplier was described as a crucial factor in influencing the uncertainty of the quality of service received (Bahli and Rivard, 2005). Less experience may indicate less sophisticated expertise and poor ability to help solve client problems. This directly leads to decreased service capacity and results in poor service quality. In particular, as IT/IS technologies advance, new skills (e.g. cloud solutions) that can be applied and new threats (e.g. security issues) that need to be prevented must be suggested by an experienced supplier (Low and Chen, 2012). Thus, service quality can be ensured. This study empirically validated the relationship between a supplier's past experiences and the perceived service quality. In addition, this research supported the positive moderating effect of signal credibility, with an IS outsourcing provider's past experiences having greater effect on the perceived service quality when signal credibility is higher. This illustrates, for service providers, that investment in experience is an important basis for quality signals. Therefore, the numbers of IS outsourcing undertaken and availability of success stories can enhance experience credibility and the selection criteria of vendors (Smith and Kumar, 2004).

Experience and capability, on the contrary, are closely related (Thompson *et al.*, 1994; Kim and Chung, 2003; Bahli and Rivard, 2005). Capabilities can be enhanced through the firm-wide experience of service providers in controlling many different projects (Han *et al.*, 2013). Enhanced core competences can provide three value propositions for both service providers and client companies through managing client-vendor interactions and can lead to higher client satisfaction (Levina and Ross, 2003; Han *et al.*, 2013). The three value propositions are personnel capability, methodology

capability, and client management capability. Personnel capability refers to IT/IS skills, ability, and knowledge of personnel to offer effective service. Moreover, this type of capability also includes industry-specific knowledge and perception of business conditions to communicate with a client company. As IT/IS technology advances and business environments rapidly change, personnel capacities of service providers improve as experience is accumulated. This strengthens the quality of outsourcing services by ensuring that staff members grasp sufficient capabilities for satisfying client requirements. Methodology capability of service providers is crucial for providing solutions to outsourcing issues through systemic problem-solving and standardized processes. An experienced supplier usually uses tools, models, approaches, charts, and tables to identify the scope, modules, functions of outsourcing, and problems need to solve and propose corresponding solutions. These methods ensure that the details of the entire outsourcing case are considered and no time is wasted in unnecessary debates, thus enhancing the quality of the implementation and the client-vendor relationship. Finally, service providers have learned the importance of client management capability from prior outsourcing experiences. This capability helps a vendor to share the condition of ongoing projects, provide valuable discussions, manage interactions, and arrange the roles and responsibilities of participants. Thus, this capability will not only alleviate the uncertainty of outsourcing but also facilitate a smooth progress of the current project. Collectively, via past experiences, these three capabilities enable service providers to keep abreast of ever-changing technologies, renew declining and obsolete capabilities, and create synergetic capabilities to maintain high-quality services and relationships (Kim and Chung, 2003; Levina and Ross, 2003; Han *et al.*, 2013).

However, an outsourcing service provider with experience and capability does not guarantee quality services because of the diversity and dynamics of influential factors (Deng *et al.*, 2013; Pomirleanu *et al.*, 2016; Gorla and Somers, 2014). Similarly, sharing outsourcing success stories does not signify the success of the next outsourcing case. In fact, for client companies, past success is only one factor in the IT/IS outsourcing provider selection process. Generally, assessment requires a lot of effort and time and involves internal and external discussions, interactions, and evaluations prior to purchase (Michell and Fitzgerald 1997; Chaudhury *et al.*, 1995; Dhar and Balakrishnan, 2006; Lacity *et al.*, 2009). Indeed, according to the empirical validation of this study, past experiences of an IS outsourcing supplier affect perceived service quality, which subsequently positively influences the intention to purchase IS outsourcing services. The signal of providers' past experiences gives an opportunity to quickly screen possible suppliers for client companies as the first step when searching for outsourcing suppliers. By doing so, client companies can save considerable time and human cost in finding qualified candidates. Thereafter, they can proceed with further assessments such as requesting for information/request for proposal, interviewing, quoting, selecting, and reviewing. Therefore, this study provides a parsimonious method to qualify service providers at the beginning of outsourcing. Meanwhile, as reported in this study, for service providers, an effective investment in experience (signal credibility) intensifies (moderates) the influence of past experiences on the client perception of service quality. This suggests a direction for marketing and practical implications for service providers.

5.2 Implications for theory

In the past, from an IT/IS perspective, many theories have been applied in outsourcing contexts (Lacity *et al.*, 2010), such as agency theory (Bahli and Rivard, 2003),

transaction cost theory (Lacity *et al.*, 2011), game theory (Elitzur and Wensley, 1997), and resource-dependence theory (Su *et al.*, 2014). Few studies have employed signaling theory to examine the influential relationship in the IT/IS outsourcing environment. This study concludes that signaling theory offers a new and strong theoretical foundation for explaining how and why past experiences of a supplier influence perceive service quality in a business-to-business outsourcing context. At the same time, this study considers the moderating effects of information asymmetries and signal credibility and validates the moderating relationship of signal credibility between the provider's past experiences and perceived service quality. In addition, in service contexts, current research has focussed much attention on the affective or exterior dimensions, such as trustworthy behaviors, websites in online commerce, or company facilities (Kharouf *et al.*, 2014; Mishra, 2013; Mavlanova *et al.*, 2012). Researchers have seldom used service providers' experience as a surrogate for perceived service quality, particularly in professional services. Our research expands a new perspective by including experience value of a supplier as a quality signal. This study also contributes to signaling literature by examining past experiences of a supplier as a quality signal that differs from other signals, such as reputation, price, and brand.

5.3 Implications for practice

This research has strategic practical implications regarding the findings. First, a direct suggestion from the results is that past outsourcing experiences must be propagated for the provider companies, particularly in related client industries, because client companies may depend on it as a crucial cue (signal), especially, first-time service buyers, to perceive the performance and service quality of the provider. This can be done through a company's website, brochures, seminars, or a new product/service launch event. Specially, websites are an important communication tool that can convey the quality of a product (Wells *et al.*, 2011).

Second, outsourcing in markets such as Taiwan is becoming increasingly competitive, which makes it difficult for new service providers or new departments entering the market to survive. Based on our research, new provider companies may make more investment in experience to attract customers. For example, the companies recruit people with the required experience (Bloom, 1984) or reduce fees to obtain more outsourcing clients in the startup years, even though the resulting expenditure is greater than the revenue earned. This leads to accumulation of experienced case numbers and generates real experiences and customers.

Third, from the customer perspective, to mitigate uncertainty, especially for first-time outsourcing, our results provide an important cue to emphasize the past experiences of the supplier. We streamlined the selection of outsourcing service providers for candidates in the early steps through providers' past experiences, and thus, client companies can save time and resources efficiently and effectively. By examining supplier experiences, particularly in related client industries, they may quickly and confidently understand the capability and performance of such vendors. This is also helpful when assessing a subsequent purchase.

5.4 Limitation and future research

Even though this study has attempted to design and implement an effective framework, there are some limitations. First, one of the main objectives of this study was, for the IT/IS field, to set up the relationship within a signaling context. Therefore,

we only identified providers' past experience as a factor that influences perceived service quality. However, more signals, e.g., perceived supplier price or supplier technology and facility investments, could be explored and may affect perceived service quality. Second, the core signaling model of this study was applied in a professional service context (i.e. IS outsourcing service). We did not test for interaction between these two hypothesized moderators. Potential extensions for future research could be nonprofessional services, online services, and tangible products as well as the interaction of moderators. Finally, the results of this research are based on the perspectives of Taiwanese companies. Potential cultural differences may affect the results, and an extension of the research could be to validate the conceptual model in other cultural environments.

6. Conclusion

In this study, signaling theory has been applied to past experiences of an IS outsourcing supplier as a potential signal of perceived service quality. The findings from this research indicated that, indeed, a provider's past experiences do affect client companies' perceptions of service quality. Additionally, a provider's past experiences had a greater effect on perceived service quality with higher signal credibility than that with lower signal credibility. Future studies can help appraise the key factors that influence how client companies perceive and interpret a provider's past experiences as a means for making service quality evaluations. Signaling theory offers a useful theoretical foundation for understanding the inherent value of past experiences and how they can help service providers better communicate with their clients. Meanwhile, the results provide a solid foundation for future investigations and pragmatic understanding to promote the recognition of past experiences for service providers to facilitate services selling.

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Further reading

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Appendix

Construct	Item	Mean	SD
Past experiences of a supplier (adapted from Bahli and Rivard, 2005; Susarla et al., 2003)			
exp1	XYZ company has performed frequently this kind of IS service	5.90	0.849
exp2	XYZ company is good in performing this kind of IS service	5.46	0.879
exp3	XYZ company is comfortable when performing this kind of IS service	5.54	0.939
exp4	XYZ company has experience with this kind of IS service in my industry	5.71	0.915
Information asymmetries (adapted from Wells et al., 2011)			
ai1	I have a good idea of what the services provided by XYZ company	5.85	0.774
ai2	I have sufficient information about the services provided by XYZ company to evaluate them effectively and accurately	5.46	1.039
ai3	I possess adequate knowledge about the services provided by XYZ company	5.67	0.904
Signal credibility (adapted from Wells et al., 2011)			
sc-e1	Having and maintaining very good experiences of IS building for an outsourcing service provider take significant effort and expense	5.94	0.831
sc-e2	When I know one outsourcing service provider had very good experiences of IS building, I assume that the company must invest a lot of time and money to own and maintain them	5.97	0.741
sc-e3	Having and maintenance of very good experiences of IS building for an outsourcing service provider require the company to make a significant financial investment	5.71	0.924
Perceived service quality (adapted from Kettinger and Lee, 1997)			
sq-assur1	The behavior of employees of XYZ company instills confidence in customers	5.68	1.042
sq-assur2	Employees of XYZ company are consistently courteous with you	6.06	0.852
sq-assur3	Employees of XYZ company have the knowledge to answer your questions	5.82	0.961
sq-empat1	XYZ company gives you individual attention	5.30	1.192
sq-empat2	XYZ company has employees who give you a personal attention	5.69	1.057
sq-empat3	XYZ company has your best interests at heart	5.39	1.165
sq-empat4	XYZ company understand your specific needs	5.46	1.154
sq-reli1	When XYZ company promises to do something by a certain time, it does so	5.71	1.110
sq-reli2	XYZ company performs the service right the first time	5.29	1.220
sq-reli3	XYZ company provides its services at the time it promises to do so	5.58	1.136
sq-respon1	Employees of XYZ company give you a prompt service	5.67	1.102
sq-respon2	Employees of XYZ company are always willing to help you	5.91	1.062
sq-respon3	Employees of XYZ company are never too busy to respond to your requests	5.65	1.213
Intention to purchase IS outsourcing service (adapted from Taylor and Baker, 1994)			
pi1	The next time I need the IS services, I will choose XYZ company	5.49	1.082
pi2	If I had needed the IS services during the past year, I would have selected XYZ company	5.38	1.202
pi3	In the next year, if I need the IS services I will select XYZ company	5.40	1.166

Note: All items are measured using a seven-point Likert scale, where 1 = strongly disagree and 7 = strongly agree

Table AI.
Measurement scales

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