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ABSTRACT

Extant literature characterizes the ties between buyers and sellers in online goods marketplaces–such as EBay or Amazon–as "arm's length" relationships. In such relationships, parties are effectively strangers, and exchange goods under the assumption that they will likely never again meet in the marketplace. The rapid rise of online service marketplaces, however, warrants a thorough examination into the applicability of these conclusions to buyer-seller relationships in the nascent markets. In this work-in-progress, we hypothesize that buyer activity in the marketplace will consist initially of "service encounters" whereby the uncommitted or inexperienced buyer gains exposure to a large number of potential suppliers. Increased experience in and reliance upon the market, we predict, will lead to a convergence towards "service relationships" as buyers seek trust, reduced risk, and close partnerships through repeated exchanges with a small set of suppliers. We intend to test this learning curve hypothesis using data collected from a leading online job auction site. The results will shed new light on the nature of buyer-seller relationships in online service-exchange markets.

Keywords

Online service markets, service relationships, buyer-supplier relations, IS outsourcing, repeat business

INTRODUCTION

Online service marketplaces provide service providers and clients with an excellent tool to find jobs and professional services from all around the world. Job auction Web sites have become increasingly popular during the past five years among small business owners who want to outsource small Information Technology (IT), marketing, accounting, writing, translation, or legal projects to service providers from the U.S., India, Russia, and many European countries. A list of popular sites would include: elance.com, rentacoder.com, guru.com, smarterwork.com, oDesk.com, getafreelancer.com, sologig.com, and snaajab.com. Clients on job auction sites are often small businesses (Radkevitch, Heck and Koppius 2006) or individuals who post auctions describing the project requirements in a form of request for proposal (RFP). Service providers, comprised of small providers and individual freelancers, prepare a bid package indicating their capabilities, delivery time, price, and other relevant documents to compete for projects. User demographics lead to a high concentration of small-sized projects. The average bid price for IT projects used in Kim (2009) and this work are $955 and $1,210, respectively. The winner is selected through a reverse auction mechanism, but the lowest bid price may not necessarily win due to non-price attributes–provider qualification and reputation, delivery time, etc–affecting the client's utility function (Kim 2009). The combination of an online marketplace with a reverse auction maximizes competition among bidders and enables firms to efficiently outsource small-scale IT projects and other professional services, offering lower costs and improved profitability achieved via reduced transaction costs (Kim 2009; Snir and Hitt 2003).

Recently, massive layoffs due to the current financial collapse drew a sudden rise in media and public attention to these marketplaces (CBS5News 2008; Flandez 2008; FoxNews 2009; Stern 2009). As about 2.5 million full-time jobs have been lost in 2008 and early 2009, job auction sites have observed a soaring number of professionals who join looking for part-time jobs. On the buyer side, companies seeking to cut budgets can look online for low-cost providers who allow buyers to pay for only what they need through customized outsourcing (Stern 2009). The recent concept of acquiring a virtual assistant refers to the practice of outsourcing simple or tedious tasks to highly specialized, remote personnel employed elsewhere. This behavior seeks economies of scale using the job auction sites; clients free up time to concentrate on their core business by relegating data entry, market research, calendar management, etc. at a much lower rate than they would incur doing such tasks themselves or hiring a more traditional personal assistant.

Despite the growing use of online service marketplaces, the buyer-supplier relationships that form in the market have not been studied. Snir and Hitt (2003) and Carr (2003) study the costs involved in evaluating and placing bids in online markets for IT services. Radkevitch et al. (2006) examine small firms' offshore outsourcing activities. Kim, Altinkemer and Bisi (2009) propose a revenue management model for IT service providers by which an IT service firm dynamically sources projects from online markets to utilize temporarily idle developers. Kim (2009) empirically tests determinants of vendor selection for IT projects.

To the best of our knowledge, this is the first study of the relationships between suppliers and clients who exchange services online. While inter-firm relationships when both parties have to invest in interorganizational systems, such as EDI or supply chain systems, have been studied (Bensaou 1997; Clemons, Reddi and Row 1993), the buyer-supplier relationship in these is different from the one we are examining in this work. The distinction is drawn because neither buyers nor sellers on an online job auction site need invest a significant amount of capital or efforts towards building a relationship-specific system or infrastructure - it is provided for them - and they incur relatively marginal costs to join the marketplace.

THEORETICAL BASIS AND RESEARCH HYPOTHESES

We have chosen to focus on outsourcing IT services because the intangible and customizable nature of IT products represents the typical characteristics of a service. This implies information asymmetries between the parties, which represents a crucial distinction from relationships in physical goods markets.

Transaction cost theorists have argued that advances in information technology (IT) lead to the development of electronic markets, as opposed to electronic hierarchies (Malone, Yates and Benjamin 1987). Buyers in markets choose the best products and services after comparing many available suppliers whereas in hierarchies, they simply work with a single supplier or small set of suppliers who are predetermined by managerial decision (Malone et al. 1987). Electronic markets reduce coordination costs, provide buyers a wide variety of options, reduce transaction risk by providing effective monitoring tools, and create tighter activity coordination between buyers and suppliers (Clemons et al. 1993; Grover, Teng and Fiedler 2002; Malone et al. 1987). Buyers join the market to access a tremendous array of skilled professionals. They create auctions, evaluate bid packages, and ultimately choose a winner from among the many suppliers. Price and terms are determined for each transaction individually, as opposed to being a prearranged condition. Furthermore, outsourcing service projects requires high coordination costs involved in searching for potential suppliers, contracting, negotiating, communicating, exchanging information, and protecting from opportunistic behavior of suppliers. Therefore, service outsourcing is especially well suited in electronic markets which reduce such coordination costs (Clemons et al. 1993; Malone et al. 1987).

Electronic markets are characterized by impersonal, arm's length relationships in which the buyers and sellers assume short-term relationships (Schultze and Orlikowski 2004). A number of studies (Ba and Pavlou 2002; Dellarocas 2005; Pavlou and Gefen 2004) have indicated that buyers transact primarily with unknown sellers, and have a low probability of encountering them again. Resnick and Zechauser (2002) collected data from eBay that show close to 90% of the encounters during a five-month period were one-shot. This explains the prevalence and necessity of systematized client reputations (via "feedback" or ratings), which replace traditional word of mouth, mitigating moral hazard problems common to transactions among strangers (Bolton, Katok and Ockenfels 2004).

However, these previous studies focus on transaction cost economics and arm's length relationships in electronic markets for physical goods and do not address client-supplier relationships in service markets. Service exchange is in nature significantly different from exchange of physical goods. It involves exchange of intangible products which cannot be precisely described until the exchange is complete. It requires a greater degree of communication, coordination, and information sharing in the buyer-supplier dyad. We argue the client-supplier relationships in online service marketplace are significantly different from arm's length relationships, despite the fact that the marketplace is built around a vast pool of strangers.

We leverage organizational theory to explain the properties of the client-supplier relationship. Organizational theory suggests that embedded relationship is the key factor in success of interorganizational exchanges (Uzzi 1997; Uzzi 1999). Embedded relationships are characterized by recurrent exchange, expectation of interdependence, goodwill, mutual trust, and sharing information. Contrast this with arm's length relationships which assume nonrecurring interactions, independence, self-interest, and opportunism (Uzzi 1997). Utilizing a similar concept but with a focus on service exchange, Gutek (1995) categorizes relationships with service providers into three groups: service encounters, pseudo-relationships, and service relationships. A service encounter is a service delivery strategy whereby customers and supplier assume one-time interaction and therefore is linked to arm's length relationship. Pseudo-relationship is related to mass production of services in modern society. Customers in pseudo-relationships interact with the same service organization but it does not guarantee they will have the same provider each time. Customers in service relationships expect repeat business in the future with the same service provider with intention of establishing embedded relationship. Repeated interactions between buyer and seller in relationships facilitate trust development but one-time interactions between strangers in encounters do not (Gutek, Cherry, Bhappu and Woolf 2000).

An increasing body of the IS literature examine the impact of IT on the buyer-supplier relationship from the relationalism perspective to complement the view from the transaction theory in forms of case study (Bhappu and Schultze 2006; Schultze 2004; Schultze et al. 2004; Standing, Stockdale and Love 2007) and survey research (Bensaou 1997; Clemons et al. 1993). In

the "Move to the Middle" hypothesis, Clemons et al. (1993) agree with the transaction cost view in that reduced transaction costs by IT makes outsourcing activities more attracted but also complement it with the relationalism view arguing that IT also leads firms to form a closer coordination with a small set of suppliers. Grover et al. (2002) content IT moderates the negative relationship between transaction costs and relationalism. Schultze and Orlikowski (2004) conduct a field study and discover that using IT within interfirm relations makes it difficult for sales representatives to build and maintain embedded relationships with their customers. The complementary view of transaction cost theory and relationalism is extended in Standing et al. (2007) where a hybrid model of buyer-supplier relationships, a local community concept within a market based mechanism, is examined.

We calibrate such complementing views on the impact of IT on buyer-supplier relationship. Certainly the benefits of electronic market, such as reduced coordination costs and huge number of options available, are the driving force attracting many buyers and suppliers in online service marketplaces. Buyers will enjoy such benefits when they first join the market. However, as the organizational theory suggests, buyers who are committed to the market will realized the benefits of service relationships. Therefore, we argue that the firms in online outsourcing marketplaces initially explore and enjoy the benefit of markets but eventually converge to the middle seeking for long-term relationship and partnership. This argument involves two distinct dimensions of buyer-supplier ties: breadth and depth. Clients initially explore wide swaths of electronic markets, thus exhibiting diverse provider selection, i.e., expanding breadth of ties. As the client's experience increases, s/he seeks recurring transactions with a small set of providers, i.e., developing depth of ties and limiting breadth. The development of breadth of relationship resembles a learning curve which has a decreasing slope. Depth of relationship is developed in an accelerated rate since buyers focus on a small set of providers as their experience with the market matures. The associated hypotheses are developed as below and also illustrated in Figure 1.

Hypothesis 1a: Clients initially expand breadth of relationships but, as the client's experience with the market increases, the growth rate of the breadth will decrease.

Hypothesis 2a: As the client's experience increases, the growth rate of depth of relationships will increase.
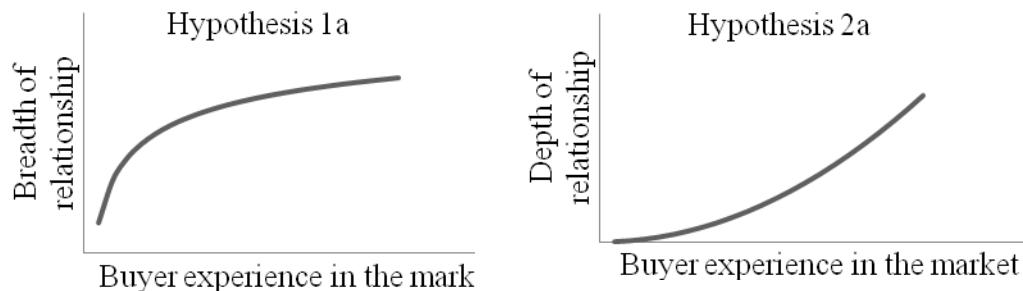

Figure 1. Illustration of hypotheses 1a and 2a

The above view can be extended to examine the impact of an interesting market parameter currently operated in many job auction sites. Buyers on the sites have an option to solicit a private auction, instead of a public auction, in which only invited service providers can participate in bidding. Inviting particular providers to a private auction indicates the buyer's explicit commitment to the relationships with the selected providers. The providers can also interpret the invitation as a reliable signal for close partnership and potential long-term relationship. Initiating an invite-only auction and responding an invitation accelerate mutual trust and partnership. Hence, we hypothesize the market parameter indicating buyer's explicit intention for partnership positively contributes to the convergence towards a small set of suppliers.

Hypothesis 1b: A client's breadth of relationship is negatively related with the use of invite-only auctions in the past.

Hypothesis 2b: A client's depth of relationship is positively related with the use of invite-only auctions in the past.

A stream of customer services literature examines how service organizations develop sustainable, long-term, trusting relationships with clients (Bettencourt, Gwinner and Meuter 2001; Webber and Klimoski 2004). Clients develop trust and loyalty when the supplier goes beyond simply completing the contract terms and demonstrates genuine care, extra effort, and truthful concerns to clients (Webber and Klimoski 2004). Such behaviors of goodwill are known as service-oriented organizational citizen behaviors (OCBs). Bowen, Gilliland and Folger (1999) identify five elements of OCBs: altruism,

courtesy, sportsmanship, compliance, and civic virtue. Service-oriented OCBs are very important in trust-building (Webber and Klimoski 2004). It is especially true in low-trust situations, such as exchanges in online markets. Cognitively, supplier's OCBs are considered as role requirements in service research (Bettencourt et al. 2001). In IT outsourcing, dedicated project staffing, effective knowledge transfer and investing time in building a good relationship with client are perceived by clients as a supplier's obligation (Koh, Ang and Straub 2004).

On job auction sites, there are providers with large numbers of employees (over 100); we argue that such OCBs can be achieved easier by smaller providers. Although large service providers leverage economies of scale and perform tasks in an efficient way, it is more difficult for them to provide personal care and voluntary goodwill beyond the contract. They follow codes and standards which ensure the quality of their products but also limit customer service. In addition, they usually have project managers who assign incoming projects to teams of employees. Therefore clients often communicate through the manager, not directly with developers. It is not guaranteed whether clients will have the same developer if they use the same organization in the future, which creates a pseudo-relationship (Gutek 1995). Such internal hierarchies in large service organizations go against some client's intention to develop a partnership and get benefits of customized outsourcing through online markets. On the other hand, individual freelancers are more flexible, and can more easily engage in OCBs communicating at their clients' convenience, and collaborate in problem-solving. With this flexibility, however comes an initially high risk of opportunism. Therefore we argue that the repeat business is related to the service provider's size once clients explore the pool of service providers in the market and identify appropriate partners for recurrent transactions.

> Hypothesis 1c: The small-size service providers have a negative moderating effect on the breadth of relationship.

> Hypothesis 2c: The small-size service providers have a positive moderating effect on the depth of relationship.

RESEARCH METHOD

Data

A large set of data was collected from one of the largest job-auction Web sites. The site maintains about 25,000 jobs posted per month and 77,000 active professionals. We started with 31,879 projects posted in the Web & Programming category between July 1, 2008 and November 25, 2008. The Web & Programming category includes all IT-related sub-categories such as Website design/programming, blog programming, software application, mobile application, search engine optimization, database development, flash animation, system administration, technical support, project management, user experience design, and testing. We chose the Web & Programming category among the many project categories such as marketing, writing, and accounting because it is one of the most populated categories in the site. By limiting our scope to a single project category, we can eliminate bias caused by buyers who have outsourced multiple projects across various categories. For example, if a buyer has posted three projects, which require Web programming, contents writing, and graphic design, respectively, the buyer has no choice other than selecting three different providers who specialize in the corresponding fields, regardless of the buyer's possible intention to do recurrent business with a provider.

Table 1. Descriptive Statistics of Projects Data

	Min	Max	Average
Date when a buyer joined the market	9/1/1999	11/1/2008	11/26/2006
Buyer's age in the market as of the current project	0 days	3337 days	758.69 days
Average bid amount of the current project	$1	$129,125	$705.34
Average cumulative purchase amount as of the current project	$0	$3,337	$7898.18
Number of bids of the current project	1	103	8.01
Cumulative number of projects posted as of the current project	1	209	11.88
Cumulative number of unique vendors as of the current project	1	111	6.24

From the initial data set, we identified 6,539 recently active, unique clients who have awarded more than one projects in the category during the above period. Since buyers can opt not to award the project if they do not find an appropriate supplier, we eliminated the projects that were not awarded. Client information includes the date a client joined the market, total number of projects posted in the category, and total dollar amount purchased. Then, we tracked these clients' complete transaction history in the Web & Programming category for their entire tenure in the market. Total number of transactions in the final

data set is 27,569. For each client, all projects they posted and the associated bid information are collected. Project information includes project's posted date, average bid amount, awarded bid amount, and awarded supplier. The overall average bid price in the data is $705.34. The awarded supplier information includes feedback rating, total number of reviews received, total revenue earned, and number of employees. Descriptive statistics of data is briefly summarized in Table 1.

Variables and Models

The unit of analysis is individual transactions per buyer. To test hypotheses 1a, 1b, and 1c, the dependent variable, *breadth of relationship $_{ij}$* is defined as the cumulative number of unique providers for buyer *i* when the buyer makes transaction *j*. We employ a log-linear form of the learning curve model, as in Pisano, Bohmer, and Edmondson (2001), to test the decreasing rate of increase in the number of unique providers. The number of unique suppliers initially increases over time as the client explores the market, followed by an eventual slowdown to a small set of suppliers. The analysis model is given as follows:

$ln($*Breadth of relationship $_{ij}$*$)$

$= \alpha + \beta_0 \, ln($*Cumulative transaction volume $_{ij}$*$) + \beta_1 \, ln($*Cumulative number of invite-only auctions $_{ij}$*$)$

$+ \beta_2 \, ln($*Cumulative transaction volume $_{ij}$*$) * ln($*Average provider size $_{ij}$*$)$

$+ \beta_3 \, ln($*Cumulative number of invite-only auctions*$) * ln($*Average provider size $_{ij}$*$) + e_{ij}$

To test hypothesis 1a, we operationalize the first independent variable, *cumulative transaction volume $_{ij}$*, as the cumulative number of transactions of buyer *i* when making transaction *j*. Hypothesis 1b is tested by the second independent variable, *Cumulative number of invite-only auctions $_{ij}$*, which is obtained by total number of invite-only auctions posted by buyer *i* by the time of transaction *j*. For hypothesis 1c, we introduce the interaction terms to test the negatively moderating effect of the use of small size providers on the total number of unique providers. The variable used in interaction terms, *average provider size $_{ij}$*, is the average size of all providers whom buyer *i* had transactions with until the buyer makes transaction *j*. Provider size is measured by average number of employees in a service organization. We expect the coefficient β_0 to be between 0 and 1 so the growth in cumulative number of unique providers approaches an asymptote as in Figure 1. Similarly, for hypotheses 2a, 2b, and 2c, we define another dependent variable, *depth of relationship $_{ij}$*, as the cumulative number of repeat transactions the given buyer *i* had with previous vendors by the time of the current transaction *j*. The model is specified in below. The coefficients are expected to be positive so the growth rate of depth is increasing as the values of independent variables increase as in Figure 1. We expect the coefficient γ_0 to be greater than 1 so the number of repeat businesses grows exponentially as in Figure 1.

$ln($*Depth of relationship $_{ij}$*$)$

$= \varphi + \gamma_0 \, ln($*Cumulative transaction volume $_{ij}$*$) + \gamma_1 \, ln($*Cumulative number of invite-only auctions $_{ij}$*$)$

$+ \gamma_2 \, ln($*Cumulative transaction volume $_{ij}$*$) * ln($*Average provider size $_{ij}$*$)$

$+ \gamma_3 \, ln($*Cumulative number of invite-only auctions*$) * ln($*Average provider size $_{ij}$*$) + e_{ij}$

In addition, transaction amount of the current transaction and buyer age in the market at the time of the current transaction are included in the above models as a control variable. Another control variable is a vector of variables indicating cumulative numbers of transactions within the sub-category to which the current transaction belongs. These variables controlling buyer experience in categories have values only if the current transaction belongs to the category. Otherwise the value is zero.

PRELIMINARY RESUTS

We report regression results of hypotheses 1a and 2a only in this proceeding paper due to the incompleteness of data cleansing for Provider-Size and Invite–Only fields. The estimated parameters are summarized in Table 2. The result indicates that the number of unique vendors increase but approaches to asymptote as buyer experience measured in cumulative transaction volume grow. The parameter β_0 is 0.741 which is less than 1, as we predicted the shape of curves in Figure 1.

The estimates for hypothesis 2a indicate that the cumulative number of repeat purchases increases exponentially as the buyer experience measured in transaction volume increases. The estimated value of the corresponding parameter γ_0 is 4.315 which is greater than 1. The control variables, Average bid amount and Buyer age, appear to impact both breadth and depth of relationship.

Table 2. Preliminary Results

Variables	Hypothesis 1a	Hypothesis 2a
Dependent variable	$ln(Breadth\ of\ relationship_{ij})$	$ln(Depth\ of\ relationship_{ij})$
Intercept	-0.323***	-9.226***
$ln(Cumulative\ transaction\ volume_{ij})$	0.741***	4.315***
$ln(Average\ bid\ amount_{ij})$	-0.011***	0.072***
$ln(Buyer\ age_{ij})$	0.076***	-0.357***
$ln(Transaction\ volume\ in\ the\ Web\ Site\ Development\ category_{ij})$	-0.097***	0.065*
$ln(Transaction\ volume\ in\ the\ Software\ Application\ category_{ij})$	0.030***	-0.277***
$ln(Transaction\ volume\ in\ the\ Flash\ \&\ Script\ category_{ij})$	-0.158***	-0.099
$ln(Transaction\ volume\ in\ the\ Wireless\ \&\ Mobile\ category_{ij})$	0.020	1.392*
$ln(Transaction\ volume\ in\ the\ Database\ category_{ij})$	-0.134***	0.477**
R^2	0.801	0.597

Note: * $p<0.1$, ** $p<0.01$, *** $p<0.001$

DISCUSSIONS

The Internet provides an excellent tool to overcome the physical, geographical, and spatial limitations of buyer-supplier interactions that otherwise would have obstructed the exchange activities (Bensaou 1997). Online marketplaces become a very popular means by which buyers and sellers find one another and interact with reduced coordination costs. The crowd of strangers has led to the concentration of arm's length relationships in online markets for physical goods (Ba and Pavlou 2002; Dellarocas 2005). Contrary to what the online market literature has observed and predicted (Malone 1998), we hypothesize that the digitized marketplace provides a useful tool but does not alter the way buyers and suppliers interact with each other significantly in service exchanges over the long term. We argue that buyers enjoy service encounters in their early experience of the market but converge to service relationships as their experience matures. The result will fill in the gap in the electronic market literature shedding light on the relatively less understood client-supplier relations in online service markets. As the results indicate that hypotheses 1a and 2a are supported, the implication of the result will have a significant impact on the literature: the client-supplier behavior is explained from the complementary view of transaction cost theory and service relationships. The timing of the research is appropriate given the growing popularity of job auction sites. Site managers can learn from the results how buyers and professionals interact on their sites and develop adequate tools to support such interactions.

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