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An investigation of factors that influence the duration of IT outsourcing relationships

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Abstract

Past studies in the IT outsourcing area have examined the management of IT outsourcing relationships from a variety of perspectives. The present paper extends this line of research. In this study, we take a multi-theoretic perspective to explore factors that determine the duration of continuing IT outsourcing relationships between vendor and client firms. Five ex-ante and two ex-post factors that may influence relationship duration were examined in this study. Data for this study were collected using a nationwide survey. To investigate the dynamics of continuing outsourcing relationships through repetitive contracts, we performed survival analysis using an accelerated failure-time (AFT) model. Four factors are found to have a significant relationship with relationship duration as hypothesized. However, three factors, of which two are ex-post factors, are found to not have a significant impact on outsourcing relationship duration. Implications and contributions of the study are discussed.
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1. Introduction

As information technology (IT)[1] outsourcing has become more pervasive, the need to manage IT outsourcing relationships on a long-term basis has become more important [49]. A survey by Input [36] shows that many clients consider switching vendors due to various causes such as lack of satisfaction with the performance of the vendor, conflicts based on typical agency problems, or newly emerging conditions and needs. However, switch-

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[1] We use the term IS and IT interchangeably in this paper in keeping with the current trends in the field.

ing vendors, especially during the course of contract execution, involves a lot of transition costs including early termination costs, switching costs, redeployment costs, relocation costs, etc. Further, in such a situation, a client company will also have to search for another appropriate service provider or take the outsourced information systems (IS) activities back in-house [47]. It may, therefore, be more beneficial for companies to nurture and maintain long-term high-quality relationships with their current vendors through persistent contract renewal.

A number of research studies have focused their attention on the issue of relationship quality in the IT outsourcing domain, and the antecedents that lead to high relationship quality, including partnership and trust

[43]. However few researchers have focused on an important aspect — the issue of relationship duration as a client can minimize the transition costs only through a longer term relationship with a single vendor. It is necessary to develop an understanding of the basic attributes and characteristics of outsourcing relationships that lead to either shorter or longer relationship durations to be able to nurture and manage longer-term relationships. This would be of value not only to practitioners responsible for managing their firms' outsourcing arrangements, it will also be of value to researchers who are interested in understanding the phenomenon of outsourcing relationship durations.

In this study, we identify several important factors from key theoretical perspectives that may have an impact on the duration of IT outsourcing relationships. Relationship duration refers to the actual time period of a continuing IT outsourcing relationship between a client and a particular vendor. The actual relationship duration may be more or less than the contract duration depending upon whether the contract was renewed or terminated early. We perform survival analysis to investigate the correlates of relationship duration using an accelerated failure-time (AFT) model time [25]. Thus, as an expansion of IT outsourcing literature in the area of governance of outsourcing engagements associated with the duration of outsourcing relationships, this research makes two significant contributions. First, we believe that the study provides new insight into the dynamics of repetitive outsourcing relationships between clients and vendors. Second, this study also contributes to the IS literature terms of introducing the technique of survival analysis with the AFT model, which has been largely used in the organizational literature.

The rest of the paper is organized as follows. After discussing background literature, we develop a research model and outline hypotheses regarding the duration of IT outsourcing arrangements. Next, the research methods including data collection and statistical analyses employed are described. Subsequently, we discuss the results, limitations, and implications of the study. Finally we present some conclusions.

2. Conceptual background

Three streams of literature yield key insights regarding the factors that may influence relationship duration in IT outsourcing arrangements: strategic perspective, economic perspective, and social perspective. Each of these literature streams is discussed in the following sections.

2.1. Strategic perspective of IT outsourcing

Drawing upon such theories as resource dependence theory [59] and resource-based theory [6], the strategic perspective of IT outsourcing has been employed to explain why and how firms formulate and implement outsourcing strategies in order to garner competitive advantages [60]. Resource-based theory has argued that IT capabilities might be a source of competitive advantage for many firms. For this to be true, IT capabilities must be rare, valuable, and hard to imitate directly or by virtue of substitutes [6]. Due to these characteristics of strategic capabilities, one might argue that it is difficult to see how any IT product or service obtained from the market can be rare, inimitable or without substitutes, and hence the source of competitive advantage directly. This is because in order for vendors to produce at lower costs due to the economies of scale, their products or services must be relatively standardized, rather than rare or unique. However, others have argued that competitive advantage arises mainly through the combination of IT capabilities with other firm-specific capabilities [9]. Moreover, organizational learning theory [35] guides us to note that the building of IT capabilities requires active learning by clients about the nuances of IT products or services. Following an absorptive capacity argument [17], however, there seems to be a little reason to believe that a client learning from an IT outsourcing engagement will be any more effective, unless there are specific routines in place to promote learning and knowledge retention. Thus, the presence or absence of learning routines of the clients could have a strong bearing on whether the client will enjoy the current relationship for garnering competitive advantages and thus develop an increasing dependency on the vendor in the future. This dependency will have implications for the duration of the relationship between the two parties.

Resource dependence theory views market environment as a set of organizations that engage in exchange relationships with one another [59]. If an organization is not self-sufficient, it is more dependent on external resources and, therefore, has more need for managing external dependence. Thus, the outsourcing strategy of a firm depends on the degree to which the focal organization exercises control over the total set of inter-organizational activities in its effort to maximize value. Based on this view, IT outsourcing literature about a decade ago, suggested limiting outsourcing only to non-core IS functions [52]. This view also guides companies to pursue backsourcing (or reverse outsourcing) to maintain strategic control over business functions [33]. This development leads to a large number of contracts being

re-negotiated or contracts ending prematurely. Most notable has been JP Morgan Chase's backsourcing of a $5 billion contract with IBM. However, as IT outsourcing becomes more prevalent and vendors become more reliable at less cost, firms are carefully looking for "strategic vendors" that can handle their strategic applications [71]. Recent research has started to address the strategic relationship aspects of IT outsourcing partnerships [49]. If IT outsourcing involves IT artifacts that are strategically important for a client, it may wish to have reliable, trusted partners over a longer periods. This would have implications for the duration of IT outsourcing relationships.

2.2. Economic perspective of IT outsourcing

The economic perspective of IT outsourcing examines the efficiency, coordination, and governance of economic transactions between firms based on the theory of transaction cost economics (TCE) and agency theory. Transaction costs are classified into two types: (i) ex-ante costs that include search costs and contracting (bargaining and drafting) costs; (ii) ex-post costs that encompass monitoring/enforcement costs, adaptation costs, bonding costs, and dissolution costs [74]. These costs represent the primary factors that determine the efficient forms for organizing economic activities. The IT outsourcing literature has examined some of the key variables of transaction cost economics [3,56]. We identified four factors from this stream of research including demand uncertainty, vendor opportunism, relationship-specific investments, and the extent of substitution that determine efficient governance modes in IT outsourcing and have implications for relationship duration.

TCE posits that firms should choose a proper ex-ante governance mode to minimize uncertainty imposed by phenomena that are hard to predict and write into the contract specific terms to minimize ex-post opportunistic behavior. Specifically, if client requirements for IT activities were uncertain, a client firm would be encouraged to keep a transaction generic and open to the market so that it can employ the best of the breed as different needs arise. This would thereby influence the firm's intention to continue with future relationships. Fear of opportunistic behaviors of the vendor also might impair relationships between vendors and lead firms to engage in shorter time frames with repetitive renewals [56].

Relationship-specific investments, i.e., the degree to which IT activities of one firm are specific to the requirements of the other firm and the extent of substitution of IT activities are also relevant in the context of relationship duration. Specific assets that develop over time and full degree of substitution of a client's IT activities by a vendor may offer economic benefits (i.e., efficiency gain and cost effectiveness) and also discourage opportunism by both client and vendor by increasing the "mutual hostage effect" between the two parties [74]. This may also influence the duration of outsourcing relationships.

2.3. Social perspective of IT outsourcing

Social theories have been employed in IT outsourcing research to address the issue of managing inter-organizational ties in the outsourcing relationship. Most of this research deals with inter-organizational dyads that help firms cope with resource scarcity while achieving goals for reducing vulnerability and uncertainty and for maximizing their own autonomy and independence. Studies using the social perspective [43,50] have drawn upon social exchange theory to understand the outsourcing relationship as a dynamic process that evolves through specific sequential interactions in which two participants carry out activities for one another and exchange valuable resources. An important finding from the social exchange perspective is that vendor–client relationships are terminated or continue based on the satisfaction of relationships. Levinthal and Fichman [51] found that positive experiences with past exchanges have significant effect on persistent relationships. Because both parties have already developed a mutual understanding, the benefits to both parties increase over time when relationships continue to persist. Therefore, satisfaction from the relationship appears to be an important variable from the perspective of relationship duration.

As the above discussion illustrates, we adopt a multi-theoretic approach encompassing three broad theoretical perspectives to identify seven key attributes from the client side, the vendor side, and those of the IT artifact that may have an influence on relationship duration. Table 1 summarizes these seven key constructs and the rationale for their inclusion in this study.

3. Model and hypotheses

Fig. 1 illustrates the conceptual model for this study that examines the factors that may influence the duration of IT outsourcing relationships. The duration of outsourcing relationships is defined as the total amount of time a client firm has engaged with a particular vendor to outsource its IT activities. Also, relationship duration that is greater than contract duration reflects the fact that the particular outsourcing engagement has continued through the renewal of a prior contract with the vendor.

Table 1
Key constructs and theoretical orientations

Key constructs	Theoretical argument	Theoretical orientations	References
Knowledge acquisition	Active mode of knowledge acquisition in the client firm enables the firm to identify and acquire externally generated knowledge which in turn spurs the organizational learning through IT outsourcing arrangements over time.	Absorptive capacity, organizational learning	[5,16,26,35]
Strategic importance of IT activity	Given the outsourcing engagement of strategically important IT function, a client firm is encouraged to leverage the expertise of other firms to the existing line of business over time, not abdicate the IT function in a short period.	Resource dependence	[27,59–61]
Relationship-specific investment	Specific investments made over time discourage opportunism, reinforce signals of the client firms, and create extendedness of the relationships	Transaction cost (mutual hostages, commitment, pledges)	[8,47,56,72,74]
Requirement uncertainty	Requirement unpredictability encourages the client firms to keep a transaction generic and open possible options in the market to enjoy the best of breed	Transaction cost	[8,63,66]
Extent of substitution	Large amount deals tend to plan greater extent of substitution by the vendor or vice versa, which jointly drive the relationships to longer duration to materialize the desired goals.	Transaction cost (coordination cost, sunk cost)	[50,52,56]
Opportunistic behavior	Opportunistic behavior over the partner impairs the relationships between the parties.	Transaction cost, agency	[8,12,38]
Satisfaction with output quality	Satisfaction will favor the relationships continued.	Social exchange (role performance)	[50,51,68]

As mentioned earlier, we identified seven factors shown in Table 1 grounded in the three major theoretical perspectives discussed earlier. Of these seven factors, five factors including knowledge acquisition, strategic importance of IT activity, relationship-specific investment, requirement uncertainty, and extent of substitution are ex-ante variables whose values are known even before the outsourcing contract comes into force. These factors might influence the duration of outsourcing relationships by actually influencing the initial contract duration. The remaining two factors including opportunistic behavior of the vendor and client satisfaction with output quality are ex-post variables. These variables are expected to affect the duration of outsourcing relationships as clients may change their intention for renewing or terminating early their contractual relationships depending upon how they perceive their vendors' opportunistic behavior and performance during the
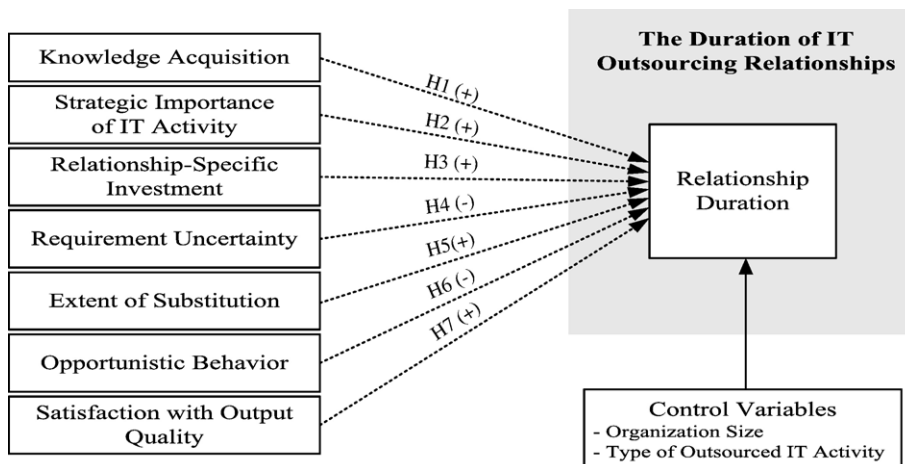

Fig. 1. The duration of IT outsourcing relationships.

course of contract execution. Therefore, these two variables are appropriate in our model as we are dealing with relationship duration through repeated contracts. These variables and appropriate hypotheses of our research are discussed below.

3.1. Knowledge acquisition

Knowledge acquisition includes organizational or individual activities to acquire information or knowledge that is potentially useful [35]. A study in the outsourcing context has found that active knowledge acquisition and learning tend to lower barriers to adopting new technology and make it easier for client firms to realize the benefits of adopting outsourcing strategies [34]. In other words, if a client firm tends to educate IT personnel on a regular basis and keep them abreast of world-class technology, the skill set of an IT department required to carry out outsourcing practices successfully would also improve. For example, such a client firm might have accumulated experiences about learning cycles and processes, which create the routines of knowledge acquisition. Because most activities in organizations follow routines [70], high level of initial knowledge and the productivity of the learning process may lead the client firm to actively engage in knowledge acquisition adopting new routines from outside their boundaries. While active knowledge acquisition gets firms rolling more effectively in the deployment of IT outsourcing, absorbing more complex services brought in by the vendor may require more detailed knowledge and take time to develop. These needs and requirements might lead client firms that are active learners to draft long-term contracts. Moreover, organization research argues that once routines develop, they persist and the persistence deepens over time; the longer a relationship is together, the less parties experiment with new ways to do things [1].

Knowledge acquisition of the client firm is also critical in realizing cost advantages, operating efficiency, and service quality improvement brought in by the vendor. Active knowledge acquisition helps IT professionals in shaping the absorptive capacity that enables a firm to identify and acquire externally generated knowledge [17]. One could argue here that a strong presence of knowledge acquisition in a client firm may negatively affect continuing relationships because it may even prompt the firm to closely scrutinize the vendor's performance and thus the vendor may even have to pass through more stringent expectations. However we believe that active knowledge acquisition in client

firms may still favor continuing outsourcing relationships with current vendors in terms of long-term contacts and/or contract renewals. This is because interruptions from switching vendors are highly disruptive to the knowledge acquisition process in IT departments where the emphasis is no longer on how to do what they do better but rather on acquiring and assimilating new practices and knowledge to realize the benefits from outsourcing [75]. Further, active knowledge acquisition of the client firm critically relates to its capacity to recognize the value of new, external skill sets, assimilate it, and apply it to commercial ends and thus enable the firm to illuminate the values within the relationship. The resulting knowledge acquisition effort might even invoke active search for new routines and examine existing routines for improvement, which increases the chance that a client firm identifies and acquires new knowledge from the current sources. This reasoning leads to the following hypothesis.

H1. There is a positive relationship between knowledge acquisition within a client firm and relationship duration.

3.2. Strategic importance of IT activity

Resource dependence theory views that a firm's decision to outsourcing IT activities depends on the degree to which the focal organization exercises control over the total set of inter-organizational activities in its effort to maximize value. Reflecting this view, earlier literature on IT outsourcing commonly suggested limiting outsourcing only to non-core IT functions because if an IT activity is the backbone of a business, any failure in the activity would significantly impair the firms' profitability [48]. From this perspective then, firms may wish to remain flexible and use shorter-term contracts in the context of outsourcing of IS activities with high strategic importance so they do not get stranded for longer periods in cases of failure but are able to switch vendors, renegotiate contracts, or relocate their activities back in-house. However, this approach tends to cause relatively larger contracting costs due to repetitive contract renewals, switching vendors, etc. and the firm's profitability is adversely affected.

Recent studies have shown that firms do indeed outsource their IS activities with high strategic impact to not only improve their IS function but to also create a business impact and to even directly exploit commercially their outsourced IS activities [20]. Further, as IT outsourcing becomes more common and standard practices for reliable delivery of services are developed, vendors are able to provide a secure flow of needed resources

at less cost in the business environment today. Thus, the issue of core and non-core is diluted and the client may be carefully looking for "strategic partners" that handle IS activities and applications having high strategic impact [46]. Further, as outsourcing embraces more significant IT activities, the "mind-set" begins to resemble that of a strategic partnership that seeks to develop situations of mutual interdependence over long-term relationships. Thus if the outsourcing involved IT artifacts that are strategically important for the client, it might like to have a reliable, trusted partner(s) over a longer period of time. Recent studies in IT outsourcing reflect this trend by emphasizing the importance of managing relationships overall, strategic alliance and partnership in particular, especially for strategic IT assets and activities [c.f., [46,49]. Therefore, firms may favor longer duration outsourcing relationships in the context of strategic IT activities and we hypothesize:

H2. There is a positive relationship between the strategic importance of outsourced IS activity and relationship duration.

3.3. Relationship-specific investment

TCE posits that the higher the specificity of the assets involved in a transaction, the more limited are alternative uses of the assets. Firms can obtain IS activities that involve less specific assets from factors' markets because less specific assets can be used elsewhere without extra effort. Thus, when a client firm wishes to outsource its IS activities that involve less specific assets, it may take advantage of its market power and competition in outsourcing market and sign shorter duration contracts so that it can continue to procure the "best of breed" products and services from the markets as they evolve and change [20]. In contrast, IS activities involving relationship-specific investment, which is defined as the degree to which outsourced IT activities require knowledge, skills, technologies, and other assets that are specific to the requirements of a client firm, may not be instantly obtained from the factors market due to the "idiosyncratic" nature of the assets involved in the outsourcing transaction [2]. Since it requires time and sustained effort to develop highly specific assets such as specific domain knowledge, longer-duration contracts may be preferred when outsourcing transactions involve relationship-specific investments. Further, the existence of relationship-specific investments generally leads to a situation of a locked-in relationship or what has been termed "mutual hostages" and this might increase the expected loss to both the client and the vendor in the relationship if it terminates in a shorter period of time [74].

In IT outsourcing relationships, vendors and clients often make relationship-specific investment in the form of tangible assets (e.g., specialized facilities and technologies) and intangible assets. In the context of IT outsourcing, intangible relationship-specific assets generally possess a high degree of information specificity[2] [15] and knowledge specificity[3] [66] which essentially refer to an organization's ability to access and deploy a specific body of prior knowledge in an inter-organizational relationship. According to transactions cost theory, an exchange relationship that relies on discrete short-term contracts is unattractive when exchange involves significant investments in relationship-specific capital [41]. Thus, when relationship-specific investments are important in outsourcing transactions, relationships will tend to be longer or more repeated contracts will appear over which the parties will establish relationship extendedness or "bonding effect" [64]. Therefore:

H3. There is a positive relationship between relation-specific investments involved in the outsourced IS activity and relationship duration.

3.4. Requirement uncertainty

A review of prior literature on IT outsourcing grounded in TCE reveals requirement uncertainty as one of prominent factors that determines efficient governance modes in the IT sourcing problem [e.g., [3,45]. Requirements uncertainty is defined as the inability to forecast accurately the IT business requirements surrounding an exchange [74]. Requirements uncertainty is expected to negatively influence IT outsourcing decisions of client firms because it is imposed by phenomena that are hard to predict and thereby hard to write into contracts in specific terms. In situations with high degree of requirements uncertainty, a client firm may wish to write short term outsourcing contracts to avoid getting stranded with contracts that are specified rigidly and, consequently, offer little flexibility to respond to changes in the client firm. Therefore, in such situations, outsourcing engagements with shorter contract terms will be preferred to better cope with contingencies that might arise.

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[2] Information specificity is defined as the extent to which the value of information is restricted to its use and/or acquisition by specific individuals or during specific time periods.
[3] Knowledge specificity is defined as the extent to which critical areas of knowledge of a service provider are specific to the requirements of a client.

Unstable requirements might further exacerbate the need for having shorter duration outsourcing relationships. For example, given rapid changes in the business environment with the advent of e-business, companies must tap into new technologies or set new business strategies in response to the emergent environment. This situation often poses a problem for contracts when the partners lack the ability to cover all contingencies and ensure proper adaptation [13]. As a result, one or both of the parties may become disenchanted with the relationship under conditions of unstable requirements. This leads companies to alter their outsourcing arrangements by renegotiating their current contracts with their vendors or even switching vendors if renegotiation doesn't work. As such, adjusting to a new environment often necessitates that client firms keep all options open so they can employ the "best of breed" technological solutions in the marketplace for their emerging requirements, and this negatively affects the continuation of outsourcing relationships. Moreover, maintaining contracts to keep them current with new requirements and services would be a daunting task because it would require the parties to have a pervasive mind set of continuous improvement, wherein both parties must continually educate themselves, analyze requirements, and update services and service levels in their contracts. This corrective action would be repeated in a continuous, iterative cycle, which could become additional service activity to existing ones [54]. Therefore:

H4. There is a negative relationship between requirement uncertainty in an outsourced IS activity and relationship duration.

3.5. Extent of substitution

Although the substitution of a client's IT activities by a vendor takes place in any type of outsourcing arrangement once the contract is put forth, we believe the extent of substitution may influence the choice of contract and relationship duration. The extent of substitution is defined as the extent to which IT functions in the client firm are being outsourced and refers to the proportion of total IT functions in the client firm being outsourced [56]. According to the inter-organizational relationship literature, commitment to a relationship is built during a protracted period of time when the size and/or importance of the exchange is high [32]. Comprehensive outsourcing arrangements are typically fraught with uncertainty and equivocality, and this can lengthen the learning curve for both the client and the vendor firms as they engage in a process of mutual

adaptation. This mutual adaptation will require longer durations and, thus, comprehensive outsourcing arrangements appear to favor longer relationship durations. This is especially true when clients use outsourcing to maneuver a strategic transition by refocusing and innovation. Innovation often requires a deep understanding of the nature of services to be developed and provided, which would also be difficult to develop over a shorter duration.

In addition, because outsourcing practices would replace a wider knowledge base within client firms, it is natural to expect that parties will try to develop mutual commitments to realize greater stability in outsourced services [43]. A consequence of this would be that clients could apply fewer resources to monitor their contracts, which will potentially mitigate some of the transaction costs. This idea may lead firms to organize their outsourcing activities favoring prolonged relationships. Therefore, we hypothesize:

H5. There is a positive relationship between the extent of substitution and relationship duration.

3.6. Opportunistic behavior

As an ex-post factor, opportunistic behavior by a vendor in a particular outsourcing relationship is expected to influence the duration of that relationship because it essentially reflects the quality of the particular relationship. Opportunism is the assumption that, given the opportunity, decision makers seek to unethically serve their self-interests, which is difficult to experience until the relationship begins [58]. Opportunistic behavior of vendors in IT outsourcing relationships may include withholding or distorting of information, failing to fulfill promises, and delivery of substandard products and services. These opportunistic behaviors impair the intimacy of relationships between vendors and clients and provide clear signals to clients about expected future behaviors of their vendors. Client firms introduce greater hierarchical governance structure in an effort to reduce opportunistic behavior by their vendors [58]. However, as a result, agility and flexibility in outsourcing may be lost and, consequently, the cost control capability and operating efficiency of the outsourced activities are compromised. Hence as the vendors' opportunism increases, client firms' intentions to continue their relationships with their existing vendors decrease. In contrast, vendors' trusting behaviors lead to continuation of relationships between vendors and clients. This is because when actors mutually and sequentially demonstrate their trustworthiness as the

process evolves over time, relationship effectiveness increases due to an increase in perceived task performance and parties to the relationship wish to continue that relationship [65]. Therefore:

H6. There is a negative relationship between a vendor's opportunistic behavior and relationship duration.

3.7. Satisfaction with output quality

Social exchange perspectives suggest that inter-organizational relationships are terminated or continued based on past experiences about relationship quality [68]. Along with opportunistic behavior of the vendor, satisfaction with output quality is incorporated in the research model to capture the quality of outsourcing relationship, which may influence relationship duration. Satisfaction with output quality is defined as a client's perception of the extent to which an IT vendor contributed to enhance the quality of output information. Output quality has been considered a critical factor in measuring the success of information systems in general [7], and of outsourcing arrangements in particular [30]. Grover et al. [30] examined output quality as a proxy to outsourcing success and found a positive relationship between observed service quality and outsourcing success.

Information quality and IT support quality have also been found to be significantly related to observed changes in outsourcing behavior [67]. Because it engenders better management decision-making and improved user satisfaction in client firms, enhanced output quality affects the clients' perceived performance of the vendor. Because of the difficulty in maintaining consistent outcomes in service relationships, clients are likely to establish enduring relationships with vendors that attain desired service levels. Moreover, it is often more cost effective for clients to maintain current vendors as opposed to continually developing new vendors, especially when current services provided are satisfying clients' needs for the most part. Thus, as client firms' satisfaction increases with respect to output quality, the likelihood of continuance of relationships with existing vendors increases. Therefore, we hypothesize:

H7. There is a positive relationship between client satisfaction with output quality and relationship duration.

3.8. Control variables

Beyond the constructs depicted in our research model in Fig. 1, other contextual variables could also influence the duration of IT outsourcing relationships. Among the salient ones are organizational size and type of IT activities outsourced. Larger organizations are more likely to engage in long-term deals and possess sufficient resources and power to foster the mechanisms for governing greater levels of outsourced activities and assets. Size is a surrogate measure for several factors that influence adoption of projects: total resources, slack resources and organizational structure.

The type of outsourced IT activity represents an important control variable that may also affect the duration of outsourcing relationships. For instance, outsourcing engagements for comprehensive outsourcing arrangements including company-specific application development (e.g., American Airline–Sabre) generally favor behavioral-based control as outcome-based performance measures are difficult to specify [14]. In contrast, outsourcing engagements for routine and commodity type services, such as PC management and maintenance activity, performance might be easily checked using outcome-based control by monitoring the market on an ongoing basis and using market information as benchmark to evaluate the costs and services of current service providers. Therefore, we include a type of outsourced IT activity as a control variable in the research model.

4. Research method

4.1. Data collection

Data for this study were collected using a large-scale mail survey method. A list of IT professionals was obtained from Directory of Top Computer Executives. 800 questionnaires were sent to top IT managers in the U. S. Respondents were asked to choose "one IS activity that had been undertaken within the last 5 years by IS vendors" for completing the questionnaire. IS activity was defined as any one or a combination of data center operations, network management, systems integration, software (firm-specific applications) development, maintenance, training, disaster recovery, and so on. In total, 154 usable questionnaires were received representing a response rate of 19.25%. For the current study, from among these respondents, we used only 93 cases that correspond to the category of outsourcing. The remaining 61 cases represent insourcing. We checked the respondent bias. For this test, we randomly selected 50 firms from non-respondent firms and respondent firms respectfully and compared their total assets, net sales and the number of employees. Table 2 summarizes the results of t-tests for an analysis of respondent bias. No significant differences were found between respondents and non-respondents at a 5% level. Tables 3 and 4 summarize respondent characteristics in

Table 2
Analysis of bias between respondents and non-respondents

Variables	Mean values of respondents	Mean values of non-respondents	t-value
Total asset	$1,051,546 (K)	$1,555,874 (K)	−0.715
Net sales	$775,528 (K)	$1,056,750 (K)	−1.036
Total number of employees	5366.84	6635.66	−1.133

terms of classification of industry and classifications of respondents with respect to IT activities.

4.2. Construct operationalization

4.2.1. Dependent variable: relationship duration

Duration of an outsourcing relationship is defined as the total amount of time a client firm has engaged with a vendor to outsource its IT activities. Thus, relationship duration could include not only the actual duration of current contract but also the duration of prior relationships through a series of contract renewals among firms. Also, the relationship duration may be less than the initial contract duration if a particular contract was terminated prematurely.

The outsourcing cases under study comprised of 62 contracts with no prior relationship and 31 contracts with prior relationships. Because some relationships under investigation were still in progress, we essentially had a right-censored data set. To deal with this right-censored data set, we used recent techniques developed in survival analysis (discussed later in detail) to test the hypotheses proposed earlier. Relationship duration of IT outsourcing arrangements is operationally defined as the time in years that has elapsed between the beginning of an initial relationship (before the current contract if the client had a prior relationship with the current vendor) and the date of the survey [14]. For example, contracts with prior relationships that were in progress at the time

Table 3
Classification of industry

Types of industry	Frequency
Manufacturing	41 (44.1%)
Finance/insurance/real estate	16 (17.2%)
Wholesale/retail/transport	8 (8.6%)
Public utilities	7 (7.5%)
Mining/construction/chemical/petroleum	5 (5.4%)
Restaurant/hotel/airline	5 (5.4%)
Advertising/consulting/health care	4 (4.3%)
Publishing	2 (2.2%)
Unknown	5 (5.4%)

Table 4
Classification of respondents with respect to IS activities

Outsourced IS resource bundles	Frequency
Application development/maintenance/implementation	28 (26.04%)
Network installation/maintenance	5 (4.65%)
Data center operation	8 (7.44%)
System maintenance	3 (2.79%)
System conversion	16 (14.88%)
System integration	10 (9.30%)
PC maintenance	4 (3.72%)
Consulting/technical service	16 (14.88%)
Disaster recovery	3 (2.79%)
Total	93 (100%)

of the survey were right-censored and relationship duration was calculated by summing the years of current contract from the beginning till the survey date in addition to the years of prior relationships. If there was no prior relationship, the relationship duration was simply the number of years elapsed since the signing of the current contract. If a contract had ended prior to the survey date, relationship duration was calculated as the sum of the number of years of prior relationship and the number of years of the contract reported in the survey by a client.

Respondents were asked to indicate: i) what year was this contract signed with your IT vendor? ii) How long is the contract term? iii) If you have a prior relationship with the outsourcing vendor before the contract, how many years did you have the relationship? These three raw inputs were used to calculate relationship duration as described above. The analysis is presented in the Results section.

4.2.2. Independent variables

The research model includes seven independent variables: knowledge acquisition, strategic importance of IT activity, relationship-specific investment, requirement uncertainty, opportunistic behavior, extent of substitution, and satisfaction with output quality. The instrument we utilized included a number of self reported "objective" and "perceived" measures and were developed based on items from existing instruments, prior literature, and input from outsourcing experts. Items were measured based on a seven-point Likert scale ranging from (1) "strongly disagree" to (7) "strongly agree".

After preliminary tests of the questionnaire and interviews with IT faculty and practitioners to refine the questionnaire, unidimensionality and reliability of the multi items' measures were assessed. Discriminant validity and convergent validity were assessed through factor analysis (see Table 5) and reliabilities using Cronbach's alpha (Appendix 1) and they were found to be adequate in

Table 5
Factor analysis

	SVP	OB	SIIA	KA	RU	RSI
SVP1	0.92	−0.08	0.04	0.01	−0.10	0.05
SVP2	0.89	−0.02	0.23	0.00	−0.02	0.03
SVP3	0.85	−0.04	0.07	−0.05	0.13	−0.10
OB1	0.10	0.86	−0.05	−0.01	0.05	0.01
OB2	−0.10	0.82	0.09	0.09	0.19	0.06
OB3	−0.15	0.80	0.06	−0.11	−0.02	−0.06
SIIA1	0.22	−0.01	0.77	−0.19	0.22	0.18
SIIA2	0.06	−0.08	0.68	0.06	0.33	−0.01
SIIA3	0.09	0.19	0.66	0.06	−0.13	0.00
KA1	−0.04	0.01	0.04	0.88	−0.02	0.06
KA2	0.01	−0.04	−0.05	0.88	0.17	0.06
RU1	0.08	0.06	−0.02	0.23	0.75	0.18
RU2	−0.15	0.10	0.31	−0.04	0.73	−0.06
RSI1	−0.12	0.01	−0.05	0.06	0.12	0.81
RSI2	0.07	−0.09	0.42	0.14	−0.07	0.62

SVP = satisfaction with vendor's performance, OB = opportunistic behavior.
SIIA = stategic importance of IS activity, KA = knowledge acquisition.
RU = requirement uncertainty, RSI = relationship-specific investments.

the context of this study. Factor analysis was used to demonstrate the unidimensionality and discriminant validity of constructs. No item was found to have either low loading (<0.5) or high cross-loading (>0.5).

Knowledge acquisition was operationalized by asking the respondents to indicate the degree to which their organization engages in learning latest IT developments. This variable was measured through two items adapted from the instrument developed earlier in IT policy [23]. Factor analysis showed that the items loaded on a single factor are with good internal consistency ($\alpha = 0.74$).

The *strategic importance of IT activity* will be high if it helps a business meet its goals. An IS activity is more likely to be perceived as important if it has more impact on achieving the business unit's strategic goal. Thus, importance of outsourced IT activities was evaluated using two items measuring the role and the strategic impact of outsourced IT activities. Instruments for this variable were adapted from previous studies on information systems' role and impact [10]. Items were found to be reliable ($\alpha = 0.77$).

Relationship-specific Investments were measured as the extent to which physical facilities or activities and the knowledge/information used in an IS activity was significantly specific to this outsourcing relationship. This is consistent with prior measures of asset specificity [73]. Two items measured this construct. They loaded on a single factor with acceptable reliability of $\alpha = 0.70$.

Requirement uncertainty was measured using two items adapted from scales developed in earlier studies

[32]. Two items measured the difficulty and unpredictability of requirements for the specific IT activity about which the respondent firm completed the survey. The items were found to uniquely capture a single dimension with a high internal consistency ($\alpha = 0.80$).

The *extent of substitution* construct was objectively measured by asking respondents to indicate the average annual contract amount as a percentage of total IT budget which reflects the proportion of total IT activities in the client firm that have been outsourced.

The *opportunistic behavior* construct was measured using three items adapted from scales in inter-firm relationship management grounded in TCE [58]. Respondents were asked to describe their perception about their vendor's behaving opportunistically. Items loaded on a single factor and were found to be well above the cut-off point showing good reliability ($\alpha = 0.79$).

Finally, *satisfaction with output quality* was measured using three items that were directly adopted from satisfaction measures in IT outsourcing success literature with respect to IT vendor's contribution to enhance information output quality [50]. Factor analysis showed that the items loaded on a single factor with exhibiting high internal consistency ($\alpha = 0.88$).

From the factor analysis, we derived composite factor scores for the independent variables that were used as predictors in survival analysis [31]. Table 6 represents means, standard deviations, and correlations of the seven independent variables. Although some of the variables are correlated significantly, correlation magnitudes do not indicate any cause for concern about multicollinearity.

4.2.3. Control variables

Organization size was measured as the amount of annual sales in the client firms. A six-point scale (0 for 0 to 99 millions; 1 for 100 to 499 millions; 2 for 500 to 999 millions; 3 for 1000 to 2499 millions; 4 for 2500 to 4999 millions; 5 for above 5000 millions) was used for this variable. Average annual sales amount substituted for the missing/unidentified cases for annual sales amounts. Type of outsourced IT activity was measured by asking the respondent to choose a specific IT activity with respect to which they were asked to complete the survey questionnaire. This was coded as a binary variable and with 0 for comprehensive type of outsourcing and 1 for commodity type of outsourcing. We used our best judgment based on our research and consulting experience in the IT outsourcing area and classified application development, systems conversion, systems integration, consulting services, and disaster recovery as comprehensive type of IT outsourcing. We also classified network maintenance, data center operations,

Table 6
Correlations and descriptive statistics

	Mean	S.D.	1	2	3	4	5	6
1. Knowledge acquisition	4.94	1.34						
2. Strategic importance of IS activity	5.43	1.09	−0.01					
3. Relationship-specific investments	4.43	1.24	0.10	0.18				
4. Requirement uncertainty	4.06	1.22	0.16	0.29	0.35			
5. Extent of substitution	4.27	2.18	−0.12	0.15	0.03	0.01		
6. Opportunistic behavior	3.47	1.52	−0.02	0.08	0.13	0.17	0.11	
7. Satisfaction with vendor's performance	4.94	1.31	−0.03	0.27	0.01	−0.02	0.16	−0.10

Correlations greater than or equal to .15 are significant at $p < .1$.
Correlations greater than or equal to .18 are significant at $p < .05$.

systems maintenance, and PC maintenance as commodity type of IT outsourcing.

4.3. Data analysis

To investigate the determinants of outsourcing relationship duration, we used accelerated failure-time (AFT) analysis, which is a survival analysis technique that allows examination of an organizational change that occurs over time [25]. Management researchers have shown considerable interest in predicting the occurrence of a wide variety of organizational events using survival analysis. In the IS field, survival analysis has been used to study factors influencing adoption events that may or may not have occurred for all observations in the study [24,31]. Studies have adopted many variations of the Cox model [18] in their survival analyses such as the semi-parametric Cox's proportional hazard model [24,31], parametric accelerated failure-time (AFT) [25], and non-proportional hazard model [53].

We used the PROC LIFEREG of SAS (PC version 9.1) to examine the effects of the independent variables (or covariates) on the survival function. We note several points about the advantages of employing survival analysis over many other techniques in this study (refer to Morita et al. [55] for a discussion of its general advantages over other predictive methods). First, it allows the probability of an event to be described as a function of time instead of constraining it to be a constant. The time elapsed, or duration, between a well-defined starting point and the occurrence of an event constitutes the dependent variable in survival analysis and is recorded for a sample of interest. From this set of durations, the probabilities of an individual case's experiencing the event can be estimated. In our context, the event of interest is the termination of an outsourcing relationship. Another advantage of employing survival analysis in this study is its capability to handle right-censored data. Data are right-censored when the data collection ends before some observations have experienced the event of interest. In our context, those out-

sourcing relationships that were ongoing at the time of data collection did not experience the event of interest at that point and these data points, thus, constitute right-censored observations. In this study, 25 cases (26.9%) of contracts were in progress at the time of survey. These right-censored observations will be systematically excluded in a regular OLS type of regression analysis. Survival analysis considers both censored and non-censored observations simultaneously to estimate the probability of occurrence of the event of interest at some point in time.

In our data set, there are a total of 93 data points. Of these 93 cases, 68 cases pertain to relationships that have completed (i.e., contracts were not renewed) and 25 cases pertain to relationships that were ongoing at the time of data collection. These 25 observations are, therefore, right-censored cases because the event of interest (termination of a relationship) has not occurred yet. Of the 93 cases, 31 cases had prior relationships (i.e., contracts were renewed) with the current vendor. However, these 31 cases with prior relationships are not necessarily the only data points that we would like to analyze to assess the factors that impact relationship duration. Rather, we wish to consider every completed as well as ongoing outsourcing relationship in our analysis. 68 completed relationships (93 − 25 = 68) in our data set provide a good basis to estimate the survival likelihoods for the 25 ongoing relationships. Therefore, we use the AFT model in the current study.

While AFT model has rarely been used in IS literature, this study applies AFT analysis to investigate the relationship duration through a survival pattern of outsourcing relationships. A hazard function formulation can be either parametric or non-parametric. AFT model borrows the Cox model of mortality [18] as a basis:

$$r(u)_t = e^{b0} * e^{c0(u)t}$$

where r = Mortality rate, u = Covariate matrix, b = Initial mortality, c = Parameter of death process, $c < 0$.

A Cox formulation does not assume any distribution of the baseline hazard, and hence is nonparametric. Cox's

model assumes that the hazard function between two groups is always proportional for all covariates regardless of time and there is no assumption of a certain baseline distribution of the survival function. These assumptions should be checked to see if the baseline function is constant across time and that the log-hazard profiles corresponding to successive values of predictors are parallel [42]. In addition, the literature notes that Cox's proportional hazard model can be an alternative to comparing the survival experiences of two groups if one were unable to find an appropriate baseline distribution [42]. A parametric formulation of the hazard model assumes a distribution of the baseline hazard. Such a parametric hazard model can be transformed into an AFT model. With AFT method, the baseline distribution must be specified although many distributional assumptions are possible [42]. Among the two-parameter distributions, Weibull distribution allows the monotonic mortality rate where a positive coefficient accelerates the baseline and a negative coefficient decelerates it. The lognormal distribution models the cases in which there is an underlying non-monotonic mortality rate, i.e., termination at first occurs slowly, then quickly, and declines again. Since the survival rate (rate of contract renewal) in this study does not depend on event ordering and the LML plot showed an almost linear line, we chose the Weibull distribution for our model. Since all covariates in the model under investigation were continuous or composite indexes, each covariate was dichotomized into two groups using an average as a datum point so as to check the proportional assumption [31]. The lines for individual strata were parallel except for the extent of substitution variable. The lines were slightly crossed in that variable. An AFT model can be transformed into an additive model using a logarithmic transformation [24]. The additive form was used to estimate the following parametric model and test the hypotheses:

$$y = a + XB + \sigma\varepsilon$$

where y=the logarithm of relationship duration, X=the covariates (i.e., all independent variables in the model), B=regression parameters, σ=the scale parameter, and ε=the errors vector.

In this way, the AFT model produces statistics that are similar to those produced in OLS regression. Coefficients from the AFT model are tested using the *t*-statistic and the goodness of fit of the model is assessed using log-likelihood, which is similar to R^2 in regression. We computed the logarithm of the dependent variable in keeping with standard practice; however, an analysis run without converting the dependent variable to a logarithm yielded the same pattern of qualitative results.

5. Results

Table 7 illustrates the survival analysis results. Substantial support was evident for many hypotheses. Knowledge acquisition (B=0.224; p=0.04), relationship-specific investments (B=0.293; p=0.00), and extent of substitution (B=0.178; p=0.00) were positively related to the relationship duration. As hypothesized, requirement uncertainty was negatively related to the relationship duration (B=−0.309; p=0.01). These results suggest that client firms that are engaged in active acquisition of new IT knowledge are likely to continue their current outsourcing relationships (survival time in relationship with the same vendor) leading to longer relationship durations in IT outsourcing. Moreover, those IT outsourcing arrangements that had a greater degree of relationship-specific investments were more likely to continue. Similarly, those outsourcing relationships where the extent of substitution of clients' IT activities by vendors was higher were more likely to persist. In contrast, when the requirement uncertainty was higher in IT outsourcing arrangements, the relationship durations tend to be shorter.

Table 7
Results of AFT survival analysis

Predictor variables	AFT analysis (DV = relationship duration)	
	Maximum likelihood estimate	Standard error
Intercept	1.028***	0.248
Knowledge acquisition	0.224**	0.112
Activity	0.195	0.130
Relationship-specific investment	0.293***	0.108
Requirement uncertainty	−0.309**	0.130
Extent of substitution	0.178***	0.048
Opportunistic behavior	−0.074	0.108
Satisfaction with output quality	0.102	0.111
Scale value	0.814	0.074
Control variables		
Organization size	−0.001	0.000
Type of outsourced IT activity	0.012	0.028
Model fit		
Log likelihood	−110.906	
Model (χ^2)	17.829***	

AFT analysis includes all 93 outsourcing cases composed of 62 cases with no prior relationship and 31 cases with prior relationships with current service providers. Of 93 cases, 25 cases were right-censored (26.9%) since the outsourcing contracts were in progress at the time of measurement.
*p<.1; **p<.05; ***p<.01

Consistent with the hypothesized directions, strategic importance of IT activity, opportunistic behavior, and satisfaction with output quality were related with the dependent variable. Surprisingly, however, these relationships were not statistically significant and we discuss these non-findings in the following section.

The likelihood ratio statistic for the model assesses the fit of the model to the data. Under the null hypothesis that a model fits the data, a log likelihood has an approximate chi-square distribution with the probability that a higher chi-square value will be obtained, if the model fits. Overall significance of the model was assessed using likelihood ratio statistics. The chi-square statistic for improvement over the no-covariate likelihood (-120.874) was 19.829 ($df=9$, $p<0.05$) indicating that the likelihood for the model that includes seven factors along with two control variables influencing the duration of IT outsourcing relationships was strongly significant. This model also contributed significantly more than a model containing only an intercept.

6. Discussion

IT outsourcing encompasses continuous decision-making throughout the contract execution phase. Ex-ante decisions include decisions about whether or not to outsource, which IT functions to outsource, and the duration of the contract, etc. However, after initial ex-ante decisions are made to outsource, companies still need to make decisions with respect to extending or terminating ongoing outsourcing contracts and this has a direct bearing on the duration of outsourcing relationships. Indeed, Dibbern et al. [19] point out that this is an area of research where gaps in knowledge of outsourcing exist and where further research is critically needed. Clearly, an understanding of the basic characteristics that point to either shorter or longer duration of outsourcing relationships might be of value not only to practitioners responsible for managing outsourcing arrangements, but also to researchers interested in understanding how outsourcing relationship duration is manifested. Thus, the overarching goal of this paper was to examine factors that might influence organizations' decisions about the duration of IT outsourcing relationships after they had already entered outsourcing engagements.

We adopted a multi-theoretic approach which is a confluence of the concerns of the client and the vendor, and the characteristics of the outsourced IT artifacts. Drawing upon multiple theories from three major streams of literature, we examined the influence of seven factors on the duration of IT outsourcing relationships. These factors are: knowledge acquisition, strategic importance of outsourced IT activity, relationship-specific investment, requirement uncertainty, extent of substitution, opportunistic behavior, and satisfaction with output quality. The results of our study indicate that four of the seven hypothesized factors played a significant role in determining the duration of outsourcing relationships.

Prior to discussing the implications of these findings, it is appropriate to discuss three major limitations of this study. First, the study utilizes a cross-sectional design and this limits our ability to claim directions of causality. In spite of its strengths, AFT analysis is subject to the same weaknesses that are common to all non-experimental research designs — that of establishing cause–effect relationships unequivocally [25]. However, theoretical arguments provided in the paper while developing the hypotheses provide some support to the direction of causality implied in the research model.

Second, several constructs in the present study utilized two-item scales which were developed based on past supporting literature. It is well-known that the more the number of items per construct, the more fully the construct captures the domain of interest and the higher is its content validity. Research in the IS literature has generally and commonly utilized three items per construct as an implicit rule of thumb for gaining adequate content validity. While several articles in the IS literature have also used less than three items to capture organizational-level constructs [4,66], we acknowledge the limitation of our study and suggest that future studies should develop and validate scales for these constructs with an adequate number of items for each construct.

The third limitation has to do with the relatively small sample size in the study that might raise questions about the generalizability of the findings in the broader IT outsourcing domain. However, our data set contains information from multiple industries about different types of IT outsourcing activities and this to some extent compensates for the relatively small sample size.

A related limitation has to do with the generalizability of the findings of this study to other outsourcing domains, such as manufacturing outsourcing, services outsourcing, or business process outsourcing. In this study, we focused on relationship duration only in the context of IT outsourcing, although some of the factors we investigated here may also be applicable in other outsourcing contexts. However, IT outsourcing possesses some unique features that are not found in many other types of outsourcing in other domains and, therefore, we make no claims about the generalizability of this study in the context of outsourcing in general. The issue of what distinguishes IT outsourcing from other forms of outsourcing is indeed a weighty one and cannot be dealt fully in this paper.

The IT outsourcing relationships that we explored in this paper involve IT artifacts that are embedded in some time, place and community. Their materiality is bound up with historical and cultural aspects of their ongoing development and use. Moreover, IT activities outsourced are also usually made up of a multiplicity of often fragile and fragmentary components, whose interconnections require bridging, integration, and articulation in order for them to work together [57]. Thus, we believe that the longer duration of outsourcing relationships is more likely required when these kinds of IT artifacts are employed rather than short-term project-based functional exchanges that are used in outsourcing practices of other domains, where outsourced activities could be obviously manifested and easily substituted by the other vendors. For instance, in many other outsourcing contexts such as services outsourcing (e.g., janitorial services outsourcing, food services outsourcing), contract durations tend to be shorter and relationships tend to be functional. In contrast, contract durations in the IT outsourcing arena generally tend to be longer and relationships tend to last more than the initial contract duration through contract renewals with the current vendor. Further, in comprehensive type of IT outsourcing arrangements, relationships tend to be more like strategic partnerships and are managed using relational governance mechanisms [46]. This is mostly because knowledge embeddedness in IT artifacts is much higher than many other products and services [57], and domain and process knowledge specificity develops over time in the IT arena creating a higher degree of relationship-specific assets that lead to higher switching costs [66]. Further, IT outsourcing contracts must deal with a changing and evolving set of IT artifacts. Even after an IT artifact that would be delivered by a vendor appears to be final and complete, its stability is conditional because new technologies are invented, different features are developed, existing functions fail and are corrected, and new standards are set. Thus contract durations tend to be longer and contract renegotiations are likely to occur in order to adapt the IT artifact for new and different uses. Therefore, while some of the findings and implications of this study may apply to other outsourcing domains, future research should examine the effect of the factors we have identified in different outsourcing contexts.

Notwithstanding the above limitations, we believe that our study makes significant contributions to research and practice. Our study found three factors that have a positive influence on IT outsourcing relationship duration and one factor that has a negative influence on the duration. Factors having positive influence include knowledge acquisition,

relationship specific investment, and the extent of substitution by the vendor. Requirements uncertainty has a negative impact on relationship duration. This suggests that outsourcing engagements that operate in an environment of higher degree of knowledge acquisition, higher degree of relationship-specific investments, and a larger extent of substitution by vendor are more likely to survive the life of contract and persist to longer relationships through contract renewals. For example, if clients are equipped with routines for active knowledge acquisition, they could more easily learn the intricacies of the IT activities performed by the vendor and can thereby realize the value and benefits from those activities more easily. Active knowledge acquisition routines will obviously strengthen and stimulate clients' attempts and involvement in learning new skill sets pertaining to the outsourced IT activities that the vendor is performing. They will allow the firm to reap benefits from their outsourced projects, and client firms are more likely to continue their outsourcing engagements with their current vendors resulting in longer duration of outsourcing relationships.

As discussed earlier, outsourcing engagements that involve significant relationship-specific investments naturally develop "mutual hostage" situations. In such scenarios, longer-duration outsourcing relationships make sense for both vendors and clients as it is in the best interest of both these parties to reap the benefits from these investments over as longer a period as possible. In such situations, it is also essential for clients to have reliable, trusted partner(s) who have developed an understanding of the specific nuances of the proprietary and transaction-specific knowledge and rules so the vendors can continue to deliver effectively with minimum coordination disturbances and agency problems. This would also lead clients to seek various types of long-term outsourcing modes, ranging from partnering agreements, building business partnerships for complete business improvement as well as building joint ventures for commercial exploitation [20]. Such requirements encourage client towards a long-term, strategic alliance relationship with outsourcing partners. Therefore, these findings suggest that developing long-term relationships between vendor and client is preferred when the potential for learning-by-doing is anticipated and when the development of relationship-specific investments is required.

In contrast, the results confirmed that when outsourcing arrangements are associated with IT artifacts for which the requirements are difficult to foresee, relationship durations tend to be shorter. Requirement uncertainties have a negative impact on the persistence of outsourcing relationships because client firms would like to be responsive to their environments and needs. They would, thus, like to retain

their flexibility and engage in the practice of using the "best of breed" vendors with shorter duration relationships so they are able to exploit fleeting "windows of opportunities".

Non-significant findings in this study are interesting and merit some discussion. First, the effect of the strategic importance of IT activity on relationship duration, while positive as hypothesized, was not significant. One reasoning for this finding could be that although firms may have decided to outsource their strategic IT portfolios, they may engage in shorter duration relationships to alleviate concerns about loss of innovative capacity, fuzzy focus, lack of organizational learning, and dangers of eternal lock-up [22].

Second, we expected that the higher the opportunistic behavior of a vendor, the less will be the client's intention to continue the outsourcing relationship and, thus, shorter relationship durations will emerge. We also expected that the higher the degree of client's satisfaction with output quality provided by a vendor, the more will be the client's intention to continue its outsourcing relationship with the vendor resulting in longer-duration relationships. Prior studies on outsourcing partnership and TCE showed a negative effect of opportunistic behavior on the governance of contractual relationship [28]. Prior IT outsourcing literature also hinted at a positive relationship between the organization's experiences with outsourcing and intentions to continue with outsourcing relationship. Nonetheless, these variables in our study were not significantly related to the relationship duration. A possible reason for these results may be that the impact of these variables on relationship duration is mitigated by other important factors that have a stronger impact on relationship duration. For instance, higher degrees of relationship specific investments tend to limit opportunistic behaviors on either side; they rather create a lock-in effect [69]. In other words, clients and vendors alike may believe that opportunistic behaviors may be detrimental to the trusting relationships that are necessary for dealing with uncertain environments in the context of high relationship specific investments. This negative consequence might mitigate opportunism as outsourcing engagements evolve. Table 6 shows that the opportunistic behavior of vendors in our data set is rather low with an average score of 3.47 on a seven-point Likert scale. This suggests that opportunism may no longer play a critical role in outsourcing relationships once participants experience their partners' cooperative behavior during the pre-contract negotiation period and initial relationship period. Future research is suggested to expand on our findings by examining the possible interaction effect of these two factors on the duration of outsourcing relationships.

Finally, it is conceivable that when client organizations are satisfied with the output quality of their outsourced IT activities, they will tend to view the relationship as valuable and will be more likely to continue with their present outsourcing relationships. However, results of this study showed that satisfaction with output quality did not significantly affect the relationship duration. It is quite possible that clients outsource their IT activities to gain improvements in business performance and are, thus, more concerned about vendors' contribution to business performance improvement rather than simply to an improvement in information quality. While the IS success model suggests information quality to be an antecedent to business performance and organizational effectiveness, there are not very many rigorous empirical studies that have tested this linkage. Further, there are many more factors other than information quality that lead to business performance. Therefore, even when clients are satisfied with the information quality being provided by their vendors, they may not necessarily believe their vendors to be delivering real value to them and may not be willing to continue long-term relationships with them. This seems to be the case in the present study. The average score for the satisfaction with information quality construct was 4.94 out of 7, which was relatively high as compared to the average scores of other constructs in this study (see Table 6). Future studies should, therefore, incorporate constructs and measures that not only capture client satisfaction with output quality but also capture the contribution of the vendor to business performance improvement.

7. Conclusion

As firms increasingly rely on IT outsourcing, management attention has turned to the ability to manage ongoing outsourcing relationships. While many researchers and practitioners have shed light on various relationship management issues in response to this need, the issue of the duration of outsourcing relationships, specifically the factors lead to long-term outsourcing relationships, remains unaddressed. Companies can enjoy significant benefits from making right choices in terms of renewing, continuing, or terminating their contracts with their current service providers and guidance to them in this area will be tremendously helpful. These needs provided the motivation for the current study.

Acknowledgement

Appendix A.
Measurements and internal consistency reliability

Measures and items	Internal consistency reliability	Key supporting literature
<<Please circle items below based on the characteristics of the specific IS activity that you chose to outsource.>>		
Knowledge acquisition	0.7439	[23,29,35]
For the specific IS activity, 1. We keep abreast of the latest IT developments. 2. We frequently send IS Personnel to educational programs or professional (1=strongly disagree; 7=strongly agree)		
Strategic importance of IS activity	0.7726	[10,44,62]
The specific IS activity 1. Offers new ways to compete. 2. Allows differentiation of products/services from competitors. (0=not applicable; 1=strongly disagree; 7=strongly agree)		
Relationship-specific investment	0.6972	[8,40,63,64]
For the specific IS activity, 1. Specialized facilities or technologies are required. 2. It is difficult for other vendors to learn the technological skills needed. (1=strongly disagree; 7=strongly agree)		
Requirement uncertainty	0.8016	[39,44]
For the specific IS activity, 1. Demands and requirements are difficult to predict. 2. Trends of changing IT business requirements are difficult to monitor. (1=strongly disagree; 7=strongly agree) <<Please circle items below based on the relationship of your firm with the IS vendor		
Opportunistic behavior	0.7871	[11,21,58]
1. Sometimes the vendor alters the facts slightly in order to get what they need. 2. The vendor works satisfactorily only if we check upon the vendor closely. 3. The vendor sometimes does not fully fulfill promises. (1=strongly disagree; 7=strongly agree)		
Extent of substitution	n/a	
The average annual contract amount with your IS vendor as a percentage of total IS Less than 1% :_____ From 1% to less than 3% :_____ From 3% to less than 7% :_____ From 7% to less than 10% :_____ From 10% to less than 20% :_____ From 20% to less than 25% :_____ From 25% to less than 50% :_____ More than 50% :_____		
Satisfaction with output quality	0.8844	[7,37,50]
With respect to the contribution of the IS vendor to the IS activity, the vendor has helped in increasing 1. Accuracy of output information. 2. Precision of output information. 3. Currency of output information. (1=lowest; 7=highest)		

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