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Relationship between Vendor/Client Complementarity, Vendor Technology Maturity, Vendor Financial Stability, and IT Outsourcing Project Outcomes

Everton A. Wilson
Walden University

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Walden University

College of Management and Technology

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Everton Wilson

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Review Committee

Dr. Alexandre Lazo, Committee Chairperson, Doctor of Business Administration Faculty

Dr. Douglas Gilbert, Committee Member, Doctor of Business Administration Faculty

Dr. Theresa Neal, University Reviewer, Doctor of Business Administration Faculty

Chief Academic Officer and Provost
Sue Subocz, Ph.D.

Walden University
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Abstract

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Vendor Financial Stability, and IT Outsourcing Project Outcomes

by

Everton Wilson

MBA, New York University, 2000

BS, New York University, 1995

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

Walden University

March 2022

Abstract

Business and IT leaders in financial services are concerned with the limited benefits they are reaping from information technology outsourcing (ITO) projects, despite continued heavy investments in ITO. Grounded in the transaction cost, agency, and resource-based view theories, the purpose of this quantitative correlational study was to examine the relationship between vendor/client complementarity, vendor technology maturity, vendor financial stability, and ITO success. Participants were 65 business and IT leaders in financial institutions engaged in ITO projects. The result of the multiple linear regression was significant, $F(3, 61) = 4.845, p = .004, R^2 = .192$. In the final analysis, vendor/client complementarity was the only significant contributor ($t = 2.551, p = .013, \beta = .362$). The key recommendation for business and IT leaders is to factor in vendor/client complementarity to improve ITO success during the vendor selection process. Incorporating complementarity may foster positive social change by allowing financial services firms to create shared values for themselves, their vendors, and the communities in which they operate.

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Section 1: Foundation of the Study

The purpose of this study was to determine the relationship between specific vendor-related factors and outcomes of information technology outsourcing (ITO) projects in U.S. financial institution clients. Vendor-related factors included vendor/client complementarity, vendor technology maturity, and vendor financial stability. Vendor/client complementarity can be defined as the synergistic benefit that comes from the alignment of vendor and client IT capabilities in an ITO relationship. Vendor technology maturity is the strength of the vendor's IT capabilities. Vendor financial stability is the strength of the vendor's financial soundness and economic viability. There has been significant research on ITO project outcomes, but none was found regarding how these specific vendor-related factors affect U.S. financial institutions. Findings from this study will help business leaders in these organizations make informed decisions that will lead to satisfactory outcomes from ITO projects.

Background of the Problem

ITO is steadily increasing as an integral component of business strategies as it offers the client the availability of outside expertise, reduced costs of IT functions, and sharing of risks (Gonzalez et al., 2016). Large organizations are primarily motivated to engage in ITO due to cost reduction and access to worldwide capabilities (Varajão et al., 2017). Additionally, ITO helps organizations free up resources to focus on core competencies (Samantra et al., 2014; Varajão et al., 2017). However, there are significant risks inherent in any firm's decision to outsource part or all IT functions to an offshore or local IT outsourcing vendor. Less than 50% of U.S. ITO projects have been

rated as successful and delivered expected benefits (Mehta & Mehta, 2017). The main reason for this low success rate is business leaders' lack of understanding of the impact of key risks and success factors affecting IT outsourcing (Poor et al., 2022; Samantra et al., 2014; Varajão). In an ITO initiative, some of these factors are related to the client firm, and some are related to the vendor.

Key client-related success factors include technology management, vendor management, and organizational relationship capabilities (Han et al., 2013; Mihalache & Mihalache, 2020; Rahman et al., 2021). Vendor-related success factors include personnel technology, vendor methodology, and vendors' client management capabilities (Han et al., 2013). Another critical success factor that is often overlooked is financial soundness (Cha & Kim, 2018). Additionally, IT decision leaders need to take into account risk factors such as loss of control of IT management and loss of intellectual property (Ahmed et al., 2014). IT business leaders can further influence ITO project outcomes through effective vendor selection by ensuring that vendor capabilities and perspectives align with the objectives of the ITO initiative (Liu & Yuliani, 2016).

Problem Statement

Organizations continue to invest heavily in ITO despite failing to realize expected benefits (Mehta & Mehta, 2017; Miao et al., 2018; Oshri et al., 2019). The general business problem is a lack of understanding among IT business leaders regarding how vendor-related factors influence ITO project outcomes, resulting in more than 50% of ITO projects failing to realize expected benefits. The specific business problem is that some IT business leaders in large U.S. financial organizations do not know the

relationship between vendor/client complementarity, vendor technology maturity, vendor financial stability, and ITO project outcomes.

Purpose Statement

The purpose of this quantitative correlational study was to determine if a significant relationship exists between vendor/client complementarity, vendor technology maturity, vendor financial stability, and ITO project outcomes. The independent variables were vendor/client complementarity, vendor technology maturity, and vendor financial stability. The dependent variable was ITO project outcomes. The targeted population was IT leaders within large financial institutions in the US who have successfully completed ITO projects.

My research findings might help to identify how ITO strategies of large financial organizations can contribute to positive social change. With my research findings, I will demonstrate the ability of corporations to create economic value for the corporation and positive social change simultaneously. Greater success of ITO projects can enable financial organizations to divert more resources to community development projects. These projects could be in the form of education, training, and improvement of IT capabilities which can support job creation. Jobs can be created through the development of small businesses, which can be a viable source of labor for vendors and client firms.

Nature of the Study

In a quantitative study, the researcher uses statistical techniques to measure causal relationships between variables to infer and predict behavior in a broader population (Basias & Pollalis, 2018). I used the quantitative method for this study. This was

appropriate because I wanted to determine if a relationship exists between variables and measure the effectiveness of vendor-related constructs in terms of predicting ITO project outcomes in financial services organizations. Researchers employing a qualitative methodology seek to explore a phenomenon or outcome through a dynamic, flexible, descriptive, and context-driven framework (Basias & Pollalis, 2018). The qualitative method was not appropriate for this study since I was not conducting exploratory research, and this method did not allow for a statistical analysis of relationships between variables.

For the quantitative methodology, there are four main research designs: correlational, experimental, quasi-experimental, and descriptive (Bloomfield & Fisher, 2019). The correlational design involves measuring relationships between a dependent variable (or outcome) and one or more independent (or predictor) variables (Bloomfield & Fisher, 2019). In this study, I employed a correlational design to measure the distribution of ITO project outcomes as a function of vendor-related predictor variables. Researchers seeking to determine cause and effect in their study would not use a correlational design, but instead employ an experimental or quasi-experimental design (Bloomfield & Fisher, 2019; Pattison et al., 2019). Experimental and quasi-experimental designs are used to test the effectiveness of interventions on an outcome and involve the manipulation of independent variables (Bloomfield & Fisher, 2019). I did not seek to determine cause and effect since interventions and manipulation of independent variables are not relevant to this study's purpose. An experimental or quasi-experimental design is therefore not appropriate for this study. A descriptive design typically involves

quantifying characteristics of a large sample and is valuable in terms of determining the frequency of which something exists (Bloomfield & Fisher, 2019). A descriptive design was not appropriate for this study since my intent was not to quantify a large sample or determine frequency but measure relationships between variables.

Research Question

RQ: Is there a significant relationship between vendor/client complementarity, vendor technology maturity, vendor financial stability, and ITO project outcomes?

Hypotheses

H₀: There is no significant relationship between vendor/client complementarity, vendor technology maturity, vendor financial stability, and ITO project outcomes.

H₁: There is a significant relationship between vendor/client complementarity, vendor technology maturity, vendor financial stability, and ITO project outcomes.

Theoretical Framework

Due to the complexity of ITO decision-making, no single theory has been found sufficient to explain the nature of research in this field (Pankowska, 2019; Rajaeian et al., 2017). In the initial stages of ITO research, the phenomena were explained from an economic theory perspective, but research since 1992 has borrowed from many other theoretical frameworks (Pankowska, 2019). The use of multiple theories in ITO research was evident in my review of the and professional and academic literature. This study was based on the theoretical framework on agency, resource-based view, and transaction cost theories.

Agency theory was formulated from Jensen and Meckling's (1976) study, where they investigated the conflicts of interest between a principal (the firm) and an agent, who the firm has contracted to create value for the firm. The agency theory is used in ITO research to explain the information asymmetry resulting from a contract between a client and the vendor or agent. The construct of vendor-client complementarity used in this study is based on the agency theory.

The resource-based view theory was inspired by Barney's (1991) seminal study on gaining competitive advantage through resources that are valuable, rare, inimitable, and nonsubstitutable. Researchers use the resource-based view theory to explain the need for an organization to seek outside expertise to complement internal resources (Hanafizadeh & Ravasan, 2018a). From this theory, I used the construct of vendor technology maturity.

Transaction cost theory was initially developed from the study by R.H. Coase (1937), where he examined the costs associated with coordinating the production process. Transaction cost theory was further developed by Williamson (1979) as a model to examine the costs of governance alternatives based on the current market conditions and the organization's internal structure. Transaction cost theory is seen as a strong theoretical background for ITO as it explains IT managers' make-or-buy decisions (Hanafizadeh & Ravasan, 2018a). The constructs for measuring ITO projects' outcomes were based on the transaction cost theory.

Operational Definitions

The purpose of these operational definitions is to assist the reader in understanding terms that are esoteric in this field of study. These definitions are based on established usage throughout professional and academic literature.

Business process outsourcing (BPO): BPO is an organizational practice involving contracting out all or part of a business process to an external service provider or vendor for implementation (Piotrowicz & Kedziora, 2018).

Complementarity: Complementarity refers to interorganizational or intraorganizational synergistic relationships among IT investments, organizational structure, and processes (Han et al., 2013).

Information technology outsourcing (ITO): ITO is the practice where an outsourcing firm or client transfers one or more of its IT-related activities that were previously held in-house to an outside service provider or vendor (Mehta & Mehta, 2017).

IT capability: IT capability is the ability of a firm (client or vendor) to acquire, develop, and leverage its IT resources successfully. From the vendor perspective, these abilities can be broken down into personnel, methodology, and IT management capability (Han et al., 2013).

Offshore outsourcing: Offshore outsourcing is the practice where a corporation is contracting out all or part of its IT functions to a foreign service provider that will provide tangible or nontangible human or nonhuman resources (Agrawal et al., 2019; Mehta & Mehta, 2017).

Assumptions, Limitations, and Delimitations

Assumptions, limitations, and delimitations are inherent in all research studies and pose risks to the validity of findings. Awareness of these risks and the steps taken to mitigate these risks are addressed in this section.

Assumptions

Assumptions are facts that are considered to be true but not actually proven or something that is accepted as true without concrete proof (Theofanidis & Fountouki, 2018). There were four key assumptions in this study. The first assumption was that participants gave honest responses to survey questions. Participants' responses can be influenced by political, ecological, and cultural forces in the environment, especially if they work in a group environment (Maher et al., 2020). Assurance of anonymity helped to mitigate this risk. Additionally, participants were informed that findings would be shared with them.

The second key assumption was that the participants chosen, who were IT managers responsible for ITO, were knowledgeable about ITO and vendor-related factors that determine ITO success.

The third assumption came from the quantitative methodology. In a quantitative study, the researcher needs to be aware of statistical data assumptions that threaten validity and reliability. Most of the data assumptions in this study were concerned with the risks of the data not being parametric. Parametric data can be modeled with a normal probability distribution and can be analyzed with normal statistical tools.

The fourth assumption was concerned with the sample of the targeted population. In this quantitative study, the sample of participants was drawn from the full population of U.S. financial institutions as listed on the Federal Reserve Bank website. It was assumed that the sample of participants was representative of the full population.

Limitations

A limitation is a potential weakness or problem that is an uncontrollable threat to the internal validity of the study (Theofanidis & Fountouki, 2018). Internal validity refers to the likelihood that the study actually measures what it was intended to measure (Theofanidis & Fountouki, 2018). All research studies inherently have limitations that the researcher has little control over, but certain steps can be taken to mitigate these limitations.

The key limitation of the study relates to participants. Participants were chosen from accessible U.S. financial institutions and may not truly represent expert opinion on ITO outsourcing factors and success. This may limit the generalization of findings to other financial institutions within the US.

Another limitation was that research participants might skip or choose not to respond to some survey questions. This would decrease the number of valid data points and negatively affect the strength of the statistical analyses. This limitation was mitigated by having a large enough sample size to maintain the strength of the statistical analyses.

Delimitations

Delimitations refer to boundaries or scope of the study in terms of what is and is not considered for the study (Theofanidis & Fountouki, 2018). Delimitations are

necessary to make the study more manageable and help the reader understand the boundaries of research. This study was limited to U.S.-based financial institutions. However, vendors that provide services to these financial institutions may be U.S.-based or offshore. These U.S. financial institutions were a main factor in the financial crisis of 2008, and ITO adoption was born out of a need for these information-intensive firms to respond to regulatory pressure and upgrade their IT infrastructure and processes (Gonzalez et al., 2013). Focusing on U.S. financial firms limited generalizability of findings, but additional research may extend findings to other data-intensive industries that use ITO.

Another delimitation was the theoretical framework chosen to develop the constructs and analyze the findings. In this study, while I made references to other theoretical frameworks, I focused on transaction cost theory, agency theory, and resource-based view theory.

Significance of the Study

With this study, I will show if vendor-related factors can help IT business leaders gain a better return on ITO investments. Additionally, I might be able to show if greater success for the organization can enable that organization to be better able to contribute to positive social change.

Contribution to Business Practice

ITO is a significant investment for many large financial institutions as they seek economic and strategic benefits associated with outsourcing IT projects and processes. Some of these benefits include competitive advantage due to reductions in costs, access

to worldwide expertise, updated technology, and the opportunity to free up resources to focus on core competencies and capabilities (Mehta & Mehta, 2017; Varajão et al., 2017). The poor success rate of ITO, with less than 50% realizing expected benefits, represents a significant loss of resources in terms of time, personnel, and money that these large firms have to contend with. Business leaders in U.S. firms will adopt strategies that can ensure a better return on ITO investment. With my findings, I will show how IT business leaders can quantify the effect of vendor-related factors on ITO decision-making. This study could help in terms of identifying vendor selection and evaluation strategies that business leaders in large U.S. financial organizations can use to help assure successful return on investment and help their organizations realize the economic and strategic benefits of ITO.

Implications for Social Change

Knowing the relationship between vendor/client complementarity, vendor technology maturity, vendor financial stability, and ITO project outcome will allow business leaders to make successful ITO decisions. Successful ITO initiatives of large financial organizations may help them contribute significantly to positive social change. As postulated by Moon and Parc (2019), incorporating social change must be considered as a symbiotic relationship between the organization and the community in which it does business. With my findings, I will demonstrate the ability of corporations to create economic value and positive social change. Greater success of ITO projects would enable U.S. financial organizations to divert more financial and technical resources to community development projects. Improvement of IT capabilities, training, and

educational development can create benefits for both organizations and local communities in which the bank and vendor operate. A better-equipped labor supply and more viable small businesses will mean better employment opportunities and a more stable local economy. This will be beneficial for both client and vendor organizations in the long term.

A Review of the Professional and Academic Literature

The purpose of this study was to determine if a significant relationship exists between vendor/client complementarity, vendor technology maturity, vendor financial stability, and ITO project outcomes. The literature review was conducted to address ITO and vendor-related factors and strategies that drive its success. Particular attention was paid to contemporary or evolving research, as well as gaps and limitations which highlight areas for further research. The literature review is organized topically to address theoretical frameworks upon which ITO research is built, challenges to existing theoretical frameworks, independent and dependent variables, measurement of constructs, and ITO business strategies.

For this study, I used the following databases via the Walden University Library: ABI/INFORM, Academic Search Complete, ACM Digital Library, ProQuest Central, SAGE Journals, Science Direct, and Ulrich's Periodical Directory. Sources included peer-reviewed journals, dissertations, and books. In order to show the chronological development of some theoretical concepts, some sources older than 5 years were included. One of the key challenges I faced in the literature search was industry terminology that is used inconsistently by different authors. I overcame this challenge by

using various permutations of key terms. The search terms I used in this study were: *outsourcing, information systems, information technology, IS, IT, IS outsourcing, IT outsourcing, ITO, ISO, risk factor, success factor, motivation, complementarity, capability, vendor, client, offshore outsourcing, back sourcing, financial services, banks, satisfaction, outcome, measurement, theoretical framework, conceptual framework, transaction cost, agency theory, and economic theories*. The literature search yielded over 500 sources, 99 of which are cited in this study. Table 1 includes percentages of sources that are peer-reviewed as well as those published within 5 years (2018-2022) of this study's completion.

Table 1

Source Identification Table

Total	Peer-Reviewed	% Peer-Reviewed	Not peer-Reviewed	Within 5 years	% Within 5 years	> 5 years
102	87	85%	15	73	72%	29

The literature review revealed that there is extant research regarding ITO that draws from a range of conceptual and theoretical frameworks. While most studies on ITO draw on economic theory, no single theoretical framework has been found sufficient to explain the nature of research in this field (Pankowska, 2019; Rajaeian et al., 2017). My literature review showed that most studies on ITO draw from several classical economic theories, especially transaction cost theory, agency theory, and resource-based view theory (e.g., Aubert et al., 2005; Gonzalez et al., 2010; Han et al., 2013; Hanafizadeh & Ravasan, 2018a; Lee et al., 2019; Liu & Yuliani, 2016; Verner & Abdullah, 2012). While

these three economic theories were most prevalent in ITO research, many studies drew upon other theories, such as technological and organizational environmental (TOE) and innovation theory, to augment or challenge the economic theories.

Transaction Cost Theory

The transaction cost theory is based on costs of alternatives based on current market conditions and organizational internal structure (Jarka, 2018; Rindfleisch, 2019). Factors that drive these alternatives include market conditions, production costs, and transaction costs (Jarka, 2018; Rindfleisch, 2019). Additionally, parties to a contract are subjected to limited rationality and are usually opportunistic (Aubert et al., 2005). If the market for a certain service is not liquid enough, then transactions are conducted with a level of uncertainty (Aubert et al., 2005). The transaction cost theory involves the production and actual transaction costs. Production costs are actual costs of creating the asset, including labor and equipment, while actual transaction costs involve management and coordination of IT activities.

Other factors that contribute to transaction costs include asset specificity and frequency of transactions. Asset specificity involves how easily an asset can be redeployed without reducing its value, and frequency of transactions refers to renegotiating a contract when changes occur (Aubert et al., 2005; Shahab, 2021). Costs have considerable variability and uncertainty and hence are a key source of risks. Client firms are encouraged by expected economic benefits from offshore providers and the ability to concentrate on core competencies (Agrawal et al., 2019; Ahmed et al., 2014). Economic benefits come with foreign exchange risks and potential loss of intellectual

property, which are faced by both clients and vendors (Ahmed et al., 2014). The more specific the information asset, the greater the risk of information asymmetry and the higher the transaction costs (Shahab, 2021).

Economic benefits were the key driver in ITO decision-making (Gonzalez et al., 2013; Verner & Abdullah, 2012). The financial services industry has peculiarities that warrant more focused research on IT outsourcing than other industries. The four main decision-making areas for the financial services industry are (a) risk factors, (b) expected benefits for IT outsourcing, (c) international consideration (offshore vendors), and (d) organizational configurations of vendors and clients (Gonzalez et al., 2013). Despite expected economic benefits, financial services firms must also consider geopolitical and organizational risks when undertaking ITO.

Varajão et al. (2017) said transaction costs and related economic benefits were the main benefits cited by client organizations. In addition to reduced transaction costs, other key motivations for large organizations engaging in ITO were obtaining outside expertise and knowledge sharing (Gonzalez et al., 2010, 2016). Most firms engaged in ITO expected reduced transaction costs, accessibility in terms of outside expertise, and access to knowledge sharing to outweigh the risks of engaging vendors in ITO.

The transaction cost theory can also be used to investigate the balance between contract design choices and IT outsourcing project outcomes. Benaroch et al. (2016) said specific transactional and relational attributes of the contract have implications on transaction costs. The specific attributes tested in terms of implications on transaction costs were contract type and extensiveness of specific contact functions. Transaction

costs can be bifurcated into *ex ante* (before the project) and *ex post* (during the project) costs (Benaroch et al., 2016). Contract type and extensiveness were found to be alternative and complementary mechanisms for minimizing transaction costs (Benaroch et al., 2016). However, the TCT has a limitation when it comes to asset specificity since assets in IT outsourcing are knowledge-based and not tangible economic assets (Benaroch et al., 2016).

In addition to asset specificity and contract design, the consideration of service level agreements can be applied to the TCT (Erdogan & Tokgoz, 2020). A well-structured service level agreement was found to correlate with higher levels of ITO success (Erdogan & Tokgoz, 2020).

Agency Theory

The agency theory involves conflicts of interest between a principal and an agent, or in the case of ITO, a client and vendor. Both principals and agents act in their own self-interest to maximize profits, and these interests may be in conflict with each other (Liu & Yuliani, 2016; Sen & Raghu, 2013). Both clients and vendors are initially motivated by profit maximization and self-interest (Liu & Yuliani, 2016). When clients' private information is shared with a vendor, there is information asymmetry, as the vendor will often have a conflict of interest.

Information asymmetry is one of the drivers of conflicts of interest in ITO initiatives (Lee et al., 2019; Verner & Abdullah, 2012). Additionally, vendors have their own strategic goals as service providers, and unless clients can motivate vendors to align their activities with clients' best interests, there will be moral hazards, such as cheating or

shirking of responsibility on the part of the vendor (Aubert et al., 2005; Liu & Yuliani, 2016; Shivendu et al., 2020). Opportunistic behaviors of vendors also make it difficult to select appropriate agents and can result in imperfect commitment of selected vendors (Liu & Yuliani, 2016; Shahab, 2021).

Conflicts of interest between clients and vendors also involve profit maximization for vendors and timely completion for clients (Shivendu et al., 2020; Verner & Abdullah, 2012). To mitigate against conflicts due to different emphasis on risk factors between clients and vendors, the concept of interdependent incentives can be employed. The agent (vendor in the case of ITO contracts) would have different motivations involving the project compared to the client. Agent and principal compensation, risk appetite, cost-benefit analysis, and incentives can affect the outcome of complementary and sequential tasks in the workflow of ITO services (Sen & Raghu, 2013). Multiple performance measures and incentives can be beneficial to the success of projects, but the client must maintain domain knowledge and active involvement (Sen & Raghu, 2013). Employing interdependent incentives and performance measures can be used to mitigate against vendor conflicts of interest in ITO projects.

The agency theory can be strengthened by adding innovation theories and strategic management theories as motivation for firms to pursue IT outsourcing (e.g., Gonzalez et al., 2010; Mathew & Chen, 2013; Susarla & Mukhopadhyay, 2019). Innovation theories involve motivation to improve quality and technical feasibility, while strategic management theories involve motivations such as increasing a firm's access to the international marketplace (Gonzalez et al., 2010). Certain risk factors such as

language problems and time zone differences are more relevant to non-US or non-English language firms (Gonzalez et al., 2010). Spanish firms are more risk-averse and exhibit more delays in terms of adopting IT outsourcing (Gonzalez et al., 2010). Client firms can employ innovation and strategic management theories to address risk factors such as language differences and time zones.

The key challenge identified by agency theory is the opportunistic behavior exhibited by the agent/vendor (Mathew & Chen, 2013; Verner & Abdullah, 2012). To safeguard against the opportunistic behavior by vendors as espoused by agency theory, a governance model using relational norms as risk mitigators have been proposed by Mathew and Chen (2013). The relational norm theory is widely used in inter-organizational relationship research. The three constructs considered are the norm of solidarity, the norm of information exchange, and the norm of flexibility (Mathew & Chen, 2013). The norm of solidarity is used to show that both parties will strive to maintain an ongoing relationship and amiably choose agreement over disagreement at all times. The norm of information exchange includes a proactive arrangement for the formal and informal knowledge transfer and information exchange between vendor and client staff. The norm of flexibility is used to illustrate an arrangement that allows for adaptations and changes to a contract as circumstances changes. Relational norms can mitigate against conflicts of interest in ITO projects. Such conflicts include conflicts between clients and vendors as well as conflicts between end-users (Verner & Abdullah, 2012). Client firms can improve outcomes of ITO projects by proactively considering solidarity, information exchange, and flexibility in service agreements with vendors.

Resource-Based View Theory

The resource-based view theory supports the concept that client firms enter into agreements with vendors to provide technical resources that are unavailable internally. Subscribers to the resource-based view theory suggest that firms outsource to access specialized expertise outside of the firm from a vendor that can cater more efficiently to a firm's needs than its own internal resources (Koo et al., 2019; Munjal et al., 2019). Scholarly research has shown that the decision to externalize or internalize activity is determined by an evaluation of the current and future economic benefits – the difference between the external transaction costs of the vendor and the internal agency costs (Munjal et al., 2019).

In addition to the expected economic benefits from externalizing IT activities, the key motivations for ITO in large organizations were resource-based and included (a) access to world-class capabilities, (b) access to technical proficiency, and (c) specialized human resources (Varajão et al., 2017). The resource-based view is used in research to analyze how a firm's resources that can lead to improved IT capabilities (Lucia-Palacios et al., 2016). Managers in large organizations engage vendors firms to access expert resources to prevent technological obsolescence.

The resource-based view theory is used in ITO research to explain the motivation for a client seeking resources and capabilities not readily available in-house (Han et al., 2013; Koo et al., 2019). These resources include organizational specific routines, skills, processes, and other resources that are critical for ITO success (Han et al., 2013; Koo et al., 2019; Miao et al., 2018). The resource-based view theory also explains the need for

an organization to seek outside expertise to complement internal resources (Hanafizadeh & Ravasan, 2018a). The resource-based view theory provides strong support for my research in developing the constructs of vendor technology maturity. Access to technical resources not available in-house and access to world-class capabilities are components of the constructs of vendor technology maturity and vendor/client complementarity.

Two emerging theories similar to the resource-based theory are the resource dependency theory (RDT) and the relationship marketing theory. RDT is closely related to the resource-based view theory but focuses on the external resources obtained by imposing inter-organizational ties or cooperative alliances (Gopalakrishnan & Zhang, 2019; Lee et al., 2019). This theory is used to show that both clients and vendors manage these ties and networks in order to improve their balance of power in an ITO relationship. Studies on client dependence have identified a competing theory: The relationship marketing theory (Gopalakrishnan & Zhang, 2019). The relationship marketing theory is used to focus on improving customer relations that satisfy both the vendor and client, while the RDT is used to show that both client and vendor manage their networks in an attempt to improve their balance power (Gopalakrishnan & Zhang, 2019).

Another emerging theory that can augment the resource-based theory is the resource orchestration theory. One of the limitations of the resource-based view theory is that it focuses only on static resources and does not take into account the dynamic nature of resources (Miao et al., 2018). The resource orchestration theory can be used to fill this gap as it takes into account the managerial actions such as selection, combining, and

leveraging resources to complement in-house resources. This investment in IT resources can positively affect firm performance, and that the role of the IT vendor as a supplier mediates the relationship between IT resources and the client firm's performance (Miao et al., 2018).

Limitations of Economic Theories

While prevalent in extant research on ITO, there are limitations to the use of economic theories. Many researchers have supported the use of transaction cost economics as the theoretical framework for IT outsourcing studies (e.g., Hanafizadeh & Ravasan, 2018a; Martins et al., 2015; Mohamed et al., 2019; Schermann et al., 2016). However, these researchers have all demonstrated limitations to the use of economic theories in IT outsourcing research. For the identification and categorization of risk factors, most of the research in IT outsourcing is based on economic theory, particularly agency theory and transaction cost theory (Pankowska, 2019; Schermann et al., 2016). However, the contradictions and limitations of transaction cost theory have been increasingly highlighted in studies since 2010. These studies have contradicting conclusions on the effects of asset specificity, frequency, and uncertainty on IT outsourcing decisions and that further research is required (Aubert & Rivard, 2016). While transaction cost theory, agency theory, and resource-based view theory have proven relevant to the research in ITO, there are limitations to their use, indicated by some contradictory conclusions drawn by researchers.

Transaction cost economics (TCE) theory is the basis for most IT outsourcing decision making, and is the theoretical underpinnings for most existing research

(Hanafizadeh & Ravasan, 2018a; Schermann et al., 2016). Some of the limitations of transaction cost theory can be addressed by leveraging the resource-based view (RBV), the resource dependency theory (RDT), and the technological and organizational environmental (TOE) theory (Hanafizadeh & Ravasan, 2018a; Martins et al., 2015). The technological and organizational environmental (TOE) theoretical framework is favored by recent studies, since it is more holistic and facilitates the consideration of a wider range of decision-making factors that can address most of the limitations of transaction cost theory (Hanafizadeh & Ravasan, 2018a). ITO research can benefit from expanding the economic theory framework to include more holistic concepts such as TOE.

While risks based on economic theories are important factors in information systems outsourcing (ISO) decisions, the TOE framework can contribute additional insight into successful ISO adoption (Martins et al., 2015). Similar to Hanafizadeh and Ravasan (2018a), Martins et al. (2015) sought to develop a framework to determine how well a firm can successfully adopt information systems outsourcing (ISO). The authors presented evidence showing that firms are increasingly turning to ISO to reduce IT expenditure, increase IT efficiency, and take advantage of external competence. The authors believe that failures in the adoption of the ISO projects by client firms can significantly decrease the economic benefits of outsourcing. Martins et al. sought to use the technology-organizational-environment framework (TOE) as the context for their study. Both Martins et al. (2015) and Hanafizadeh and Ravasan (2018a) demonstrated how the TOE has been used to study and facilitate IT adoption at the firm level by taking

into account the technological, organizational, and environmental factors facing the organization.

Meta-analysis of transaction cost economics (TCE) in ITO research has identified inconsistencies in how TCE is used as the theoretical framework (Schermann et al., 2016). The effectiveness of TCE as the analytical framework ranges from strong to poor. TCE was more effective in explaining ITO phenomena in early research but less relevant in more recent research (Schermann et al., 2016). This is mainly due to task uncertainty and contract type being increasingly difficult to operationalize using TCE (Schermann et al., 2016). Traditional economic theories, in their basic form, might not be as appropriate as they were designed for researching business problems concerning economic assets (Schermann et al., 2016). While TCE and TCT are still prevalent in ITO research, newer studies have shown that the effectiveness of economic theories will decrease as ITO projects become more complex. Schermann et al. (2016) concluded that the traditional economic theories might not be as appropriate as they were designed for researching business problems concerning economic assets.

In response to Schermann et al. (2016) critique of TCE, Aubert and Rivard (2016) suggested that it is important to examine the boundary condition when using a theory from one field to apply to a new field; in this case, TCT, which is borrowed from economics to apply to ITO. The key boundary condition is around asset specificity. In traditional economics, the asset can be tangible, but in IT, the asset is mostly information, an intangible asset for which it is more difficult to add specific attributes (Aubert & Rivard, 2016). Conflicting and inconclusive results in many IT outsourcing research do

arise from misuse of TCT constructs and the unsuitability of the theory in some specific context of IT outsourcing. Therefore, careful examination of the specific research topic and applicable theories should ensure that the theory fits the phenomena, and the research fits the theory (Aubert & Rivard, 2016).

Similar to Schermann et al.'s (2016) review of TCE in ITO research, studies by Pankowska (2019) and Aubert and Rivard (2016) also alluded to the TCE's limitations. Pankowska contended that governance of the firm and multi-outsourcing initiatives are very specific contexts that need to be taken into consideration while using and TCE in ITO research. While Pankowka did not refute the use of TCE on ITO research, he welcomed the development of a new endogenous theoretical framework for future ITO research that addresses new innovations in ITO. Aubert and Rivard (2016) showed that this inappropriate use of theory is not because of the applicability of the economic theories but because researchers sometimes fail to evaluate the boundary conditions of the theories. In applying Aubert and Rivard's suggestions to ITO, the problem of defining and measuring information assets will be specifically addressed when considering economic benefits. Economic theories can be leveraged in ITO research, but their application must be tailored to fit the context of ITO and factor in issues such as non-tangible assets, asset specificity, task uncertainty, the operational environment, and governance models.

In the next sections, I review the literature on vendor/client complementarity, vendor technology maturity, vendor financial stability, and measuring ITO project

outcomes. I will also address challenges faced in measuring the constructs and briefly review alternative constructs.

Vendor/Client Complementarity

Complementarity can be defined as the synergistic benefit of doing more of both sides of an activity, such as contractual governance and relational governance (Erdogan & Tokgoz, 2020; Huber et al., 2013). Several studies have been conducted to examine the effect of complementarity on ITO success (e.g., Han et al., 2013; Huber et al., 2013; Kim et al., 2010; Sen & Raghu, 2013). Han et al. (2013) studied the effects of complementarity between vendor and client IT capabilities, while Huber et al. (2013) studied the relationship between complementarity and substitution in contractual relations. Both studies suggested that ITO success is greater when both client and vendor IT capabilities and tasks complement each other.

Huber et al. (2013) studied the complementarity between contractual governance and relations governance and hypothesized that both types of relationships between the client and vendor are critical for information systems (IS) and information technology (IT) outsourcing success. Conversely, substitution suggests doing more of one activity decreases the benefit from the other (Huber et al., 2013). The authors also examined the opposing view, the substitution view, which suggests that over time, one type of relationship supersedes the other. The complementarity between vendor and client was theorized as an enabler of IT outsourcing success (Han et al., 2013). This theory is grounded in the theories of economies of scale that can be attained from the effective use of human and technological resources (Rehm & Goel, 2017). If both vendor and client

have similar IT capabilities, they will complement each other and achieve synergies or outsourcing success attributable to more than the sum of both vendor and client IT capabilities (Han et al., 2013). Complementarity is a form of synergy where the ITO transaction is mutually beneficial to both client and vendor.

Synergies created by client and vendor workflow activities can be affected by the compensation model and cooperation between client and vendor personnel (Kim et al., 2010; Sen & Raghu, 2013). A study by Kim et al. (2010) on partner knowledge complementarity is one of the earlier studies on complementarity in IT outsourcing. Kim et al. focused on the complementarity of knowledge creation, which is the synergistic effect of cooperation in knowledge creation (Rehm & Goel, 2017). The utility obtained from a partnership in knowledge creation in IT outsourcing can be greater than the sum of the knowledge created by each individual partner.

To maximize this synergy, incentives for IT outsourcing services performed by the vendor should not be treated separately from incentives to client personnel except in limited cases where both parties are risk-neutral (Sen & Raghu, 2013). In most cases, both parties are risk-averse, with the vendor being more risk-averse (Sen & Raghu, 2013). There are three types of interdependent scenarios: (a) where performance measures are correlated, (b) when specific workflow actions are complementary or substitutable, and (c) when workflow actions are sequentially dependent. Congruent or interdependent incentives treatment between vendor and client personnel is necessary to deal with the complexities of correlated complementary, substitutable, sequential

processes (Sen & Raghu, 2013). Maintaining interdependence in performance and incentives measures will help to create and maximize synergy in an ITO project.

Several studies sought to measure the effect of the level of vendor contribution to IT outsourcing outcomes (e.g., Jain & Khurana, 2016; Lucia-Palacios et al., 2016). These studies were driven by the lack of research on the vendor contribution to IT outsourcing, and the authors sought to address the gap. In their research on IT outsourcing services by Indian vendors, Jain and Khurana (2016) investigate the vendor contribution to the IT outsourcing outcome through the construct of client-vendor relationship (CVR). The study showed that vendor technical contribution, vendor business value addition, and vendor knowledge sharing positively impacts CVR and IT outsourcing outcomes (Jain & Khurana, 2016). The level of vendor technical contribution also positively impacts IT outsourcing outcomes (Lucia-Palacios et al., 2016). However, this contribution must be moderated to prevent over-dependence on the vendor in the long term (Lucia-Palacios et al., 2016). These studies have shown that while the vendor's capabilities and contributions are critical to the ITO relationship, the client must be fully engaged to prevent over-dependence on the vendor.

Vendor Technology Maturity

The capability of the outsourcing vendor is a critical success factor in ITO success (Gopalakrishnan & Zhang, 2019; Wang & Wang, 2019; Wibisono et al., 2019). These capabilities include technical capabilities, software development capabilities, operational capabilities, as well as human resource capabilities (Wibisono et al., 2018, 2019). The IT maturity level of an organization is a measure of this capability (Stachowiak & Oleśków-

Szłapka, 2018). There are also specific capabilities that a vendor must demonstrate that are relevant to outsourcing and offshore outsourcing. Such capabilities include the ability to manage the cultural and temporal differences (Wibisono et al., 2018, 2019). A vendor's technical capability must include flexibility to deal with the client's unique specifications and must demonstrate the ability to coordinate the development of volatile specifications (Wibisono et al., 2019). In most outsourcing models, the vendor would typically possess more technical and project knowledge, while the client possesses more business and domain knowledge (Wibisono et al., 2019). The vendor will need to coordinate the sharing of this knowledge with the client for ITO projects to be successful (Wibisono et al., 2019). While the vendor's capability is critical, the client must ensure that the ITO arrangement includes knowledge sharing and knowledge transfer to the client.

The relationship between vendor IT capabilities and ITO outcomes can also be explored by focusing on the dynamic capability view (DCV) (Wang & Wang, 2019). The DCV takes into account the volatile business environment and the rapid pace of technological change. Wang and Wang (2019) posited that a vendor needs to be able to acquire, integrate, and configure various resources in order to cope with the volatile business environment. These capabilities can be grouped into learning capability and integration capability. Integration capability can be further broken down into an internal and an external component (IIC and EIC) (Wang & Wang, 2019). Research has shown that both internal and external integration capabilities have a positive effect on ITO success and that the vendor's learning capabilities has a moderating effect on the relationship between IIC/EIC and ITO success (Wang & Wang, 2019). The vendors'

ability to integrate various resources is a component of the construct for vendor technology maturity.

A key measure of vendor capabilities is their level of innovation in IT solutions for their client. In order to improve relationships with clients, vendors are increasingly more complex and innovative offerings (Gopalakrishnan & Zhang, 2019). In their study on client dependence on vendor's IT solutions, Gopalakrishnan and Zhang (2019) drew upon both the Relationship Marketing theory as well as the resource dependency theory. The level of client dependence in an ITO relationship can improve vendor innovation and vendor performance, both of which ultimately improve ITO outcomes (Gopalakrishnan & Zhang, 2019). This client dependence is usually beneficial to both parties in an outsourcing relationship. However, that client dependence can also be detrimental to the client as the vendor can increase its balance of power as a result of developing specialized resources and capabilities (Gopalakrishnan & Zhang, 2019). Client firms in an ITO relationship must balance their dependence on the vendor with their own strategic goals.

Measurement of Variables

The academic and professional literature has noted the difficulty of measuring the factors that drive ITO (Liu & Yuliani, 2016). Challenges come from identifying the factors as well as quantitatively evaluating the factors (Liu & Yuliani, 2016). Many researchers have used surveys and questionnaires to gather quantitative data to measure the constructs in ITO research (e.g., Han et al., 2013; Hanafizadeh & Ravasan, 2018a; Jain & Khurana, 2016; Kim et al., 2010; Martins et al., 2015). Due to the qualitative and

still evolving nature of this field of study, some researchers also used interviews with experts to help identify potential risk factors not captured in previous literature (e.g., Liu & Yuliani, 2016; Mathew & Chen, 2013).

Many recent studies, such as Liu and Yuliani (2016) and Samantra et al. (2014) have used expert groups not just to help identify as well as evaluate the importance of the various factors that affect IT outsourcing success. Liu and Yuliani (2016) studied the importance of various risk factors from both the vendors' and clients' perspectives, noting that the difference in perspective is often a factor in IT outsourcing failure. Samantra et al. (2014) used focus groups consisting of experts and decision-makers in capturing risk factors and associated linguistic data in their study on IT outsourcing risk assessment. Jain and Khurana (2016) also used this approach when identifying risk factors in the Indian banking industry. These groups may be drawn from the client-side, vendor-side, or consultants.

Measuring the complementarity requires that both the vendor's and the client's capabilities be considered simultaneously. Complementarity can be measured from the IT capabilities of the vendor and client (Han et al., 2013) or from the knowledge sharing capacity of the vendor and client (Kim et al., 2010). In a study on ITO complementarity, Han et al. (2013) aimed to test the hypothesis that the IT capabilities of the vendor and the client should be considered together as complementary to each other. Han et al. hypothesized that complementarity between vendor and client adds success to the IT outsourcing success. The authors adapted existing data collection instruments such as surveys and questionnaires and completed a pilot test as well as completed tests to ensure

content, convergent, and discriminant validity. While the data was collected from two different groups, a key concept in the analysis of complementarity was the reciprocal responses, i.e., the vendor ratings on the client and vice-versa (Han et al., 2013).

In their study on partner knowledge complementarity, Kim et al. (2010) developed two main hypotheses: (a) potential knowledge complementarities between the client and the vendor have a positive relationship with ITO effectiveness, and (b) The relative absorptive capacity of the ITO vendor has a positive relationship with ITO effectiveness. Using a large sample of 874 firms that had IT outsourcing engagements, Kim et al. (2010) conducted a survey and statistical analyses to test their hypotheses. They were able to operationalize the complementarity variables and found significant support for both hypotheses. Similar to Han et al. (2013), Kim et al. measured complementarity using both vendor and client capabilities simultaneously. Knowledge sharing and knowledge acquisition capacity of the vendor are important to ITO success and are components of the vendor technology maturity construct.

The strength of the vendor-client relationship (CVR) is another indicator of complementarity in ITO (Ali et al., 2020; Jain & Khurana, 2016). Key barriers to a successful CVR include poor quality of service, communication gaps between the vendor and client, and poor coordination (Ali et al., 2020). Measurement of vendor contribution to ITO outcomes can be achieved via the construct of CVR (Jain & Khurana, 2016). Jain and Khurana (2016) demonstrated that knowledge sharing, technical value addition, vendor adaptability, and communication could be used as the key independent variables. The authors hypothesized that each variable (knowledge sharing, technical value

addition, vendor adaptability, and communication) positively influences CVR. Using a survey data collection method and a quantitative design, Jain and Khurana (2016) were able to operationalize the variables and, with the resulting statistical analysis, found a significant correlation to prove their hypotheses.

Martins et al. (2015), as well as Hanafizadeh and Ravasan (2018a), also used survey data collection instruments in their study of the effect of economic and environmental factors and the ITO decision-making process. Martins et al. used a sample population of 600 firms selected at random from a pool of small, medium, and large firms. The respondents from the firms were senior IT leaders, directors, and senior management, and other stakeholders engaged in ITO decision-making. The results showed that firm size, management support, competitive pressure, regulatory environment, and complexity of IT project has a statistically significant effect on ISO adoption.

Hanafizadeh and Ravasan (2018a) complemented Martins et al.'s (2015) study on the effect of economic and environmental factors on the ITO decision-making process. Hanafizadeh and Ravasan used an extensive questionnaire of 300 questions as well as using secondary data from the Central bank. Their findings showed that IT outsourcing adoption level is affected by various factors grouped into technological, organizational, and environmental buckets. The main factors include: perceived complexity, perceived cost, service observability to the client, cultural fit between client and vendor, perceived loss of organizational knowledge, prior outsourcing experience, and suppliers' power.

These measures were effectively operationalized using a questionnaire with 5-point Likert scales (Hanafizadeh & Ravasan, 2018a).

The academic and professional literature has noted the difficulty of measuring the factors that drive ITO. However, researchers have identified vendor-related factors through a combination of interviews, expert groups, and pilot tests. These factors include technical value addition, knowledge sharing, vendor adaptability, and communications. Operationalization of the factors has facilitated data collection via surveys and questionnaires administered to both vendor and client-side personnel.

Other Independent Variables

In the complex nature of ITO research, no model has been identified that consistently accounts for all the factors and independent variables that drive ITO success. Other independent variables outside the theoretical framework include supplier relationship management, IT governance, and strength of contractual agreement. Another approach in the study of IT outsourcing success is measuring factors and outcomes from the perspective of the vendor and its suppliers (Cha & Kim, 2018). Cha and Kim highlighted the fact that many IT outsourcing vendors depend on sub-contractors and that a successful delivery of service to the ultimate client also depends on the vendor's relationship with its sub-contractors. They posited that the degree of a vendor's success in supplier relationship management (SRM) influences the degree of success in its IT outsourcing initiatives for the ultimate client.

The strength of IT governance is another potential predictor of ITO success (Erdogan & Tokgoz, 2020). IT governance is the biggest challenge faced by IT leaders

who have engaged in IT outsourcing initiatives (Lioliou et al., 2019). The strength of IT governance is a key factor in ITO outcomes and that this governance has two forms: formal and relational (Erdogan & Tokgoz, 2020; Lioliou et al., 2019). More specifically, for effective IT outsourcing outcomes, IT leaders should not over-rely on a formal legal contract nor rely too heavily on the informal (relational) contract (Lioliou et al., 2019). For a more successful ITO project outcome, both forms of governance complement each other and can work effectively in concert (Lioliou et al., 2019).

Other potential predictors of ITO success include the strength of the relationship and the strength of the contract (Erdogan & Tokgoz, 2020). Strong outsourcing relationships and the strength of the contractual agreement are key to success in IT outsourcing outcomes (de Carvalho et al., 2018; Erdogan & Tokgoz, 2020). De Carvalho et al. (2018) hypothesized that aspects of the contractual agreement are related to the critical success factors that drive the IT outsourcing relationship. The cost of service, the service level agreement, and the detailed contract were the most important contractual elements cited by both vendor and client but in different ranking order (de Carvalho et al., 2018). A successful partnership requires several cycles of interaction starting with the formal contract but continuing with consistent communication, mutual understanding, and sharing of knowledge and experience (de Carvalho et al., 2018).

ITO Project Outcomes

ITO success can be broadly defined as the level of fitness between the client needs (or requirements) and outsourcing outcomes (Han et al., 2013). In this context, outsourcing success was measured by evaluating the strategic, economic, and

technological gains as a result of the outsourcing project(s) (Han et al., 2013; Karimi-Alagheband & Rivard, 2020; Lahiri et al., 2022; Liu & Huang, 2020). From the client perspective, ITO success is also viewed as the vendor providing quality solutions and cost efficiencies in a timely manner (Mehta & Mehta, 2017). There is an inherent difficulty of measuring outcomes in ITO decision-making since most instruments are based on the perception of the client personnel interviewed or surveyed, which can contain bias (Delen et al., 2019). Additionally, the temporal component of ITO initiatives makes it difficult to measure success since some positive or negative downstream outcomes might not be known before an extended period of time (Delen et al., 2019). The true measure of ITO success may not be known until a client firm starts reaping strategic benefits in the future.

ITO project success can be simply defined as the level of satisfaction achieved by the client. In several studies on client evaluation of information systems outsourcing initiatives, the authors took a novel approach in determining ITO success by focusing on the satisfaction component (e.g., Gonzalez et al., 2019; Oshri et al., 2019). In these studies, the authors consider customer satisfaction the final and comprehensive indicator of IT outsourcing success. The authors explained that this was a second-order construct, based on the first-order construct of the perceived benefits of IT outsourcing. The first-order benefits construct was based on the motivation for engaging in IT outsourcing projects in the first place. This benefits construct can be broken down into constructs for economic, technological, and strategic benefits (Gonzalez et al., 2019; Oshri et al., 2019)

The determinants of ITO success can also be grouped into two categories: controllable and rigid (Delen et al., 2019). Controllable determinants can be changed or manipulated by the client or vendor during the early phase of the sourcing process or during service delivery, while the rigid determinants are fixed at the start of the project and cannot be changed during service delivery (Delen et al., 2019). In a study on Dutch ITO success and failures, Delen et al. (2019) took the approach used by many researchers and measured IT success based on the perceptions of the client and vendor. In their construct, the authors measured the client's and vendor's perspectives on the extent to which their objectives were met. This perspective was the key to IT outsourcing success measurement. While this measure was contextual, the authors refined the construct by using five sub-items, three from the clients' and two from the vendors' perspective (Delen et al., 2019). While ITO success is typically seen as measured from the client-side, a more appropriate measure of ITO success is to consider both the client and vendor perspective on their objectives being met.

Successful outcomes from ITO can also be measured in terms of improving the capabilities of the client that results from an ITO initiative (Karimi-Alagheband & Rivard, 2020; Lucia-Palacios et al., 2016). Lucia-Palacios et al. (2016) drew upon transaction cost theory and the resource-based view theory to investigate the effects of ITO and vendor support on a client firm's technological capability. The benefits of cost reduction can sometimes be offset by loss of IT capabilities from over-reliance on the ITO vendor. They hypothesize a U-shaped relationship between vendor support and the client firm's level of technological capability. This relationship is characterized by initial

cost reductions and efficiencies in the shorter term but less technology opportunism and innovation on the client-side in the long run (Lucia-Palacios et al., 2016). Additionally, firms that have a high level of IT use benefit more from extensive ITO than SMEs (Lucia-Palacios et al., 2016). The research by Lucia-Palacios et al. (2016), therefore, supports the benefits of improved technological capability from ITO usage by large financial institutions. Large financial services firms with a high reliance on IT can benefit from successful ITO in the short term from cost reduction. Long-term, strategic benefits from ITO success can be achieved by ensuring knowledge sharing and monitoring reliance on the vendor.

Summary

The specificity of the sample in most of the studies was the overriding limitation encountered and shows a general weakness in the research conducted to date. However, this research focuses on the analysis of effective IT outsourcing strategies for large U.S. financial institutions that are in public scrutiny and subjected to regulatory monitoring. The literature shows that there are significant gaps in the ability to generalize much of the results of the research, mostly due to the specificity of the research objectives and small sample sizes. While several theoretical models have been offered, there is no consensus on the best theoretical framework to base further research; in fact, many of the studies did not specifically cite a conceptual or theoretical model. Most of the conceptual and theoretical approaches have proven useful, but in the studies reviewed, they were validated with only one case study or using a small specific demographic sample.

One overriding theme is the use of a combination of theoretical frameworks to explain ITO decision-making. While transaction cost theory is the most cited theoretical framework, most studies drew upon several theories to address the limitations in any one theory. As examples: Mohamed et al. (2019), in their study of ITO drivers in Kenyan commercial banks drew upon transaction cost and resource-based view theories; Sen and Raghu (2013) used both transaction cost and agency theories to explore interdependence between vendor and client in ITO initiatives; Hanafizadeh and Ravasan (2018a), in their study of ITO decision making in e-services drew upon transaction cost and resource-based view theories as well as the Technological, Operational and Environmental framework.

Transition

In Section 1, I presented the foundations of the study and the background of the problem. With the background of the problem, I showed how organizations have failed to gain satisfactory outcomes for ITO projects despite continued investments in these initiatives. The business problem, research question, and hypotheses were supported by the background of the problem. I then presented the purpose for conducting this study: To determine if a significant relationship exists between vendor/client complementarity, vendor technology maturity, vendor financial stability, and ITO project outcomes. I have also outlined the nature of the study, in which I briefly introduced and justified the quantitative research method and correlational research design. The theoretical framework that supports the hypotheses was then examined. In the literature review section, I presented an exhaustive overview of the academic and professional literature.

In the literature review, I expanded the theoretical framework and reviewed supporting and alternative theories and concepts. Additionally, I reviewed the existing literature supporting the variables for this study as well as alternative variables. The current state of research in the field and the gaps in the academic literature were also examined in the literature review.

In Section 2, I outlined in detail the rationale for choosing the research methodology and research design for conducting this study. I also outlined my role as the researcher, the rationale for choosing the participants and population, and the steps that I took to ensure ethical research practices were followed. Additionally, in this section, I explained in detail the data collection instruments, the data collection techniques, data analysis techniques, and steps taken to ensure the validity and reliability of the study findings.

In Section 3, I present the data analysis results and findings. I also outline the results of tests taken to confirm study validity and reliability. Additionally, in Section 3, I show the implications for business practice, the potential contributions to social change, and the contribution to the academic and professional literature. Finally, I examine the limitations of this study and the opportunities for further research.

Section 2: The Project

In this section, I outline in detail the research methodology and design for conducting this quantitative correlational study. I start with the purpose statement, outline my role as the researcher, and address the steps taken to mitigate bias and maintain objectivity. I then present the rationale for choosing participants and population and steps that were taken to ensure ethical research practices were followed. I then examine alternative research methods and designs and outline in detail the rationale for choosing a quantitative correlational research design. Next, I discuss population and sampling, as well as ethical research considerations. Additionally, in this section, I explain in detail data collection instruments and techniques, data analysis techniques, and steps that were taken to ensure the validity and reliability of study findings.

Purpose Statement

The purpose of this quantitative correlational study was to determine if a significant relationship exists between vendor/client complementarity, vendor technology maturity, vendor financial stability, and ITO project outcome. Independent variables were vendor/client complementarity, vendor technology maturity, and vendor financial stability. The dependent variable was ITO project outcomes. The targeted population was IT leaders within large financial institutions in the US who have successfully completed ITO projects.

My research findings will help to identify how ITO strategies of large financial organizations can contribute to positive social change. With my research, I will demonstrate the ability of corporations to generate economic value and positive social

change simultaneously. Greater success of ITO projects can enable financial organizations to divert more resources to community development projects. These projects could be in the form of education, training, and improvement of IT capabilities, which can support job creation. Jobs can be created through the development of small businesses, which can be a viable source of labor for vendors and client firms.

Role of the Researcher

In this quantitative correlational analysis, my role as the researcher involved (a) collecting primary data for the independent and dependent variables, collecting secondary data on financial stability, organizing data for statistical analysis, performing statistical analysis, and interpreting results of statistical analysis. Data collection for vendor/client complementarity, vendor technology maturity, and ITO project outcomes involved using questionnaires and surveys. Data collection for vendor financial stability involved retrieving financial data from government and industry databases.

As a practitioner in IT and finance, I have a strong passion for research in the area of ITO in the financial services industry. I have 22 years of experience in IT-related roles in the financial services industry. For the first 15 years of this tenure, I worked as part of consultant firms helping clients with IT projects related to risk management, regulatory reporting, and compliance. The clients I worked with included most of the 20 largest financial services firms operating in the US. My main role in these projects was to assist clients with data analysis and technology solution portions of projects. Since 2014, I have switched roles in the industry and became an employee of one of these large banks. I now experience outsourcing from the client side as I continue to work on IT-related risk

management, regulatory reporting, and compliance projects, many of which involve outsourced services. While conducting this study, I was working as an advanced financial data analyst on regulatory reporting projects. While I was working at one of the big four banks in the US, I did not influence any data collection process as I ensured that I had no direct reporting relationship with any participant chosen for the gathering of primary data. Additionally, surveys were administered anonymously, and I did not link participants' identities with individual responses. My professional experience helped me to understand and analyze data, and I avoided making any predictions about the findings in this study.

As the researcher, I followed the three fundamental principles outlined in *The Belmont Report*. The three principles are respecting the person, maximizing beneficence, and ensuring justice (National Commission for the Protection of Human Subjects and Biomedical and Behavioral Research, 1979). Participants were fully informed about the aim of this research, and their participation was kept confidential. The risk of harm to individual participants was outweighed by the benefits of contributions to business practice and social change. Participants were selected, with no especially vulnerable groups being targeted. I obtained approval and certification from Walden University's IRB before starting primary data collection. This certification required the completion of a Collaborative Institutional Training Initiative to protect human participants.

Participants

In this section, I outline eligibility requirements for participant selection and how I gained access to participants. The targeted population was IT leaders within large financial institutions in the United States who have completed ITO projects with

satisfactory outcomes. Participants were IT and business leaders in financial institutions who had direct involvement in the decision-making and execution of ITO projects. Participants were involved with vendor selection, developing business requirements, project management, budgeting and control, contract management, conflict resolution, knowledge management, developing metrics, and reporting. Specific roles of participants were senior systems analysts, senior data architects, application systems engineers, business systems managers, chief information officer, and data owner. Each participant was able to identify their role by referring to a standard description.

Participants were selected from each of the 20 largest U.S. banks by asset size. This list of the largest banks was sourced from the U.S. Federal Reserve Bank website. All participants were IT leaders who had been engaged in a successful ITO project. I gained access to organizations by using a research participation request (see Appendix A) explaining the research purpose, eligibility criteria, and expected contributions to business practice and practitioner literature. To establish working relationships, individual participants were provided with informed consent forms. A survey link that included the consent form was distributed by the Human Resources department at each participating bank on my behalf. The informed consent process must include full disclosure of the purpose of research and be easily comprehended by participants, and allow volunteers so that participants can make competent decisions (Geier et al., 2021; Kaewkungwal & Adams, 2019). I worked with Walden University's IRB and the targeted organization to ensure that I abided by all legal protocols. Participants were asked to complete surveys online for convenience and ease of data collection.

Research Method and Design

The research problem, the research purpose, and the research question must be consistent with the research methodology for high-quality research (Abutabenjeh & Jaradat, 2018). The approach to research method and design depends on whether the researcher is seeking a causal explanation of a phenomenon or seeking to explore and interpret that phenomenon (Basias & Pollalis, 2018). In this study, I used a quantitative research method with a correlational design to answer the research questions.

Research Method

I used a quantitative research method in this study. There are two broad approaches to social sciences research: Quantitative research method and qualitative research method (Basias & Pollalis, 2018; Farghaly, 2018; Rutberg & Bouikidis, 2018). Quantitative methodology is aligned with the positivist worldview and is informed by objectivist epistemology (Basias & Pollalis, 2018; Farghaly, 2018). In a quantitative study, the researcher uses statistical techniques to measure the causal relationships between variables in an effort to infer and predict behavior in a broader population (Basias & Pollalis, 2018; Taguchi, 2018). In a quantitative study, the researcher uses pre-selected variables that represent measurable constructs (Taguchi, 2018). The quantitative approach is suitable for summarizing statistical data, testing statistical hypotheses, and supports generalization of results (Farghaly, 2018). I will be using a quantitative method for this study. The choice of the quantitative method is appropriate since I will be measuring the effectiveness of pre-selected vendor-related constructs in predicting ITO projects' outcomes in financial services organizations.

Researchers employing a qualitative methodology align their study with constructivist epistemology and seek to explore a phenomenon or outcome through a dynamic, flexible, descriptive, and context-driven framework (Basias & Pollalis, 2018; Taguchi, 2018). In a qualitative approach, the researcher is more committed to understanding the reasons behind a phenomenon and searches for patterns of evidence in the data by using a large number of elements (Taguchi, 2018). The qualitative method is not appropriate for this study since I will not be conducting exploratory research.

In addition to the two broad approaches, researchers can also employ a mixed-method approach, where both qualitative and quantitative approaches are combined sequentially or concurrently in a single study with the potential to combine the best of both methods (Rutberg & Bouikidis, 2018; Taguchi, 2018). The mixed-method approach is also not appropriate for this study since I will not be doing an exploratory component, and I will only be using measurable constructs.

Research Design

I employed a correlation design in this quantitative study. There are four main research designs within quantitative methodology: correlational, experimental, quasi-experimental, and descriptive (Bloomfield & Fisher, 2019; Duckett, 2021). With a correlational design, the researcher measures the relationships between a dependent variable (or outcome) and one or more independent (or predictor) variables (Bloomfield & Fisher, 2019; Duckett, 2021). In this study, I will be employing a correlation design to measure the distribution of ITO projects' outcome as a function of vendor-related predictor variables. Researchers seeking to determine cause and effect in their study

would not use a correlational design, but would instead employ an experimental or quasi-experimental design (Bloomfield & Fisher, 2019; Pattison et al., 2019). Both experimental and quasi-experimental designs would require manipulation of the variables and include control groups (Duckett, 2021; Miller et al., 2020). Additionally, a true experiment would require random assignments of participants to groups (Duckett, 2021; Miller et al., 2020). Since I was not seeking to determine cause and effect, nor was I in a position to manipulate variables and create control groups, I did not choose an experimental or quasi-experimental design for this study. A researcher typically uses a descriptive design to quantify the characteristics of a large sample (Bloomfield & Fisher, 2019; Duckett, 2021). A descriptive design is not appropriate for this study since I will be measuring the relationship among variables.

Population and Sampling

The targeted population was IT leaders within large financial institutions in the United States who have completed ITO projects with some degree of satisfactory outcomes. The sample of participants for primary data collection was IT and business leaders in these financial institutions who have had direct involvement in the decision-making and execution of the various stages of implementation of multiple ITO projects.

For a quantitative research study, it is important that the sample frame represents the population and unit of analysis (Mweshi & Sakyi, 2020; Sarstedt et al., 2018). In my study, the sample frame is the list of IT business leaders who have contributed to the decision-making processes for ITO projects. There are two basic types of sampling, random (or probability) and non-random (non-probability) (Mweshi & Sakyi, 2020;

Sarstedt et al., 2018). In probability sampling, each unit is chosen at random from the population and has an equal chance of being selected (Mweshi & Sakyi, 2020; Sarstedt et al., 2018). Conversely, in a non-probability sampling, the chance of each unit being selected is not known, since the researcher would use judgment or other strategies to select the units for the sample (Mweshi & Sakyi, 2020; Sarstedt et al., 2018). I have chosen the judgmental (or purposive) non-random sampling technique because the population is predefined to be employees with a specific skill set. Purposive or judgmental sampling is useful when the researcher needs to select units from the population that satisfy a particular purpose (Mweshi & Sakyi, 2020; Sarstedt et al., 2018). In the case of this study, the potential participants were business leaders and managers with specific knowledge of ITO initiatives.

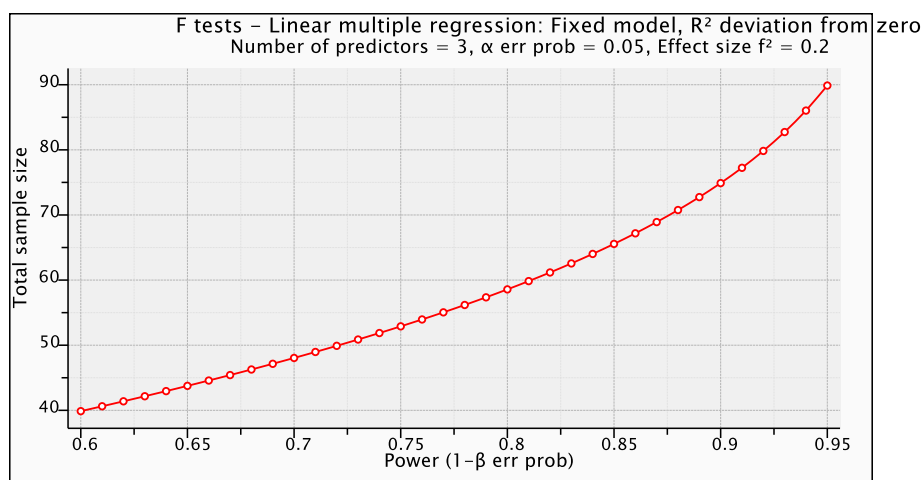
The sample size is critical in quantitative research since this will affect the validity of statistical analyses (Norouzian, 2020). To determine the appropriate sample size, I used a power analysis. Three key parameters for a power analysis are (a) the alpha level (probability of falsely rejecting the null hypothesis denoted as α), (b) the power (the probability of correctly rejecting the null hypothesis denoted as $(1-\beta)$), and (c) the effect size (the amount of variance attributable to the predictor variables denoted as f^2) (Hickey et al., 2018). Typical values for α are between 0.05 and 0.01; typical values for β are between 0.2 and 0.1; while the effect size is typically taken from a priori research (Hickey et al., 2018).

I used G*Power 3.1 software to perform the power analysis. The parameters used were α of 0.05, β of 0.2, and a medium effect size f^2 of 0.2 taken from a prior research

study by Han et al. (2013), who used similar predictor variables. For a linear regression statistical procedure with three predictor variables, the sample size was found to be 59. Further extending the G*Power analysis, I also found that the power increased to 0.95 with a sample size of 90. I therefore targeted a sample size of between 59 and 90 for this study (Figure 1).

Figure 1

Power as a Function of Total Sample Size



Ethical Research

As the researcher, I followed Walden University's research protocol to ensure that studies involving human subjects undergo independent ethics review by the IRB.

Adhering to strict ethical protocols in research is necessary to ensure that human participants are protected from potential physiological, psychological, and informational harm (Geier et al., 2021). This ensured that this research adhered to the three fundamental

principles outlined in the Belmont Report. The three principles of the Belmont Report are respecting the person, maximizing beneficence, and ensuring justice (National Commission for the Protection of Human Subjects and Biomedical and Behavioral Research, 1979).

The informed consent process is associated with the first principle of the Belmont Report, respect the person. Participants were fully informed about the aim of the research, and their participation will be treated with strict confidentiality. The actual names of the participants or their financial organizations were not collected. The informed consent form and data use agreement required by each organization were reviewed by the IRB. Survey participation was voluntary, and any participant could have chosen to withdraw by not completing the online survey even after they had started.

I offered no incentives for participation in the study. However, the second principle of the Belmont Report, beneficence, ensures that the minimal risk of harm to the individual participants would be outweighed by the benefits of contributions to business practice and social change (National Commission for the Protection of Human Subjects and Biomedical and Behavioral Research, 1979). As part of the formal request to each participant organization, I indicated the intent to share results and findings with the organization.

The third principle of the Belmont Report, ensuring justice, is to ensure that participants will be selected with no especially vulnerable groups being targeted (National Commission for the Protection of Human Subjects and Biomedical and Behavioral Research, 1979). I obtained approval and certification from Walden

University's IRB before embarking upon any primary data collection. This certification required the completion of a training course protecting human participants. To further protect the confidentiality of participants, the data collected was stored on a secured drive and will be permanently deleted after 5 years.

The main consideration in my IRB application was concerned with the primary data collection. The collection of primary data required the following support from partner organizations; (a) the organizations would be distributing a study invitation on my behalf, (b) the organizations would be permitting employees to use paid time on my behalf, and (c) the organizations would be permitting me to evaluate their operations. The Walden University's IRB approval number for this study is 10-28-20-0236501.

In my research, I collected primary data from financial organizations within the United States via a survey method. The surveys were administered anonymously and did not link the participant's or the client organization's identities with individual responses. Ensuring anonymity ties in with the second principle of the Belmont Report, *respect the person* (National Commission for the Protection of Human Subjects and Biomedical and Behavioral Research, 1979). As a separate exercise, I also collected publicly available financial data on ITO vendors.

Data Collection Instruments

The data collection instruments for this study were the client IT capability measures, the vendor IT capability measures, and the IT outsourcing success measure. These measures were adapted from a priori research by Han et al. (2013) in their study of complementarity in ITO projects using a three-measure survey instrument. These

measures have been used effectively in extant research on ITO (Han et al., 2013; Koo et al., 2019).

The client IT capability measure, influenced by the research by Lee et al. (1995), was a second-order factor measured by three underlying factors: technology management capability, organizational relationship capability, and vendor management capability. Each of these underlying factors had four to six items in the survey questionnaire. The vendor IT capability measure, also influenced by Lee et al. (1995), was a second-order factor measured by three underlying factors: personnel capability, methodological capability, and client management capability. Each of these underlying factors had four to six items in the survey questionnaire. The vendor IT capability measure provided the values for the vendor technology maturity independent variable.

The outsourcing success measure was a first-order factor with nine items based on the clients' strategic, economic, and technological gains and similar to the approach used by Han et al. (2013) and Karimi-Alagheband and Rivard (2020). The outsourcing success measure provided the values for the ITO projects' outcome-dependent variable.

The vendor/client complementarity variable was not collected directly from the participants but was derived in the data analysis similar to the process used by Han et al. (2013). High values of both vendor IT capability and client IT capability were translated into high complementarity, and low values of both vendor IT capability and client IT capability were translated into low complementarity.

Participants responded to these items/questions using a 5-point Likert scale. The independent variables vendor/client complementarity and vendor technology maturity

were numeric and had an interval scale, with values ranging from 1 to 5. ITO project outcome was numeric and had an interval scale, with values ranging from 1 to 5. An overview of the survey instrument is shown in table 2. The full structure of the survey instrument is shown in Appendix B.

Table 2

Overview of Survey Instrument

Vendor technology maturity	Client technology maturity	Outsourcing success
Personnel capability	Technology management capability	Strategic gains
Methodological capability	Organizational relationship capability	Economic gains
Client management capability	Vendor management capability	Technology gains

The independent variable, vendor financial stability, was measured using their operating earnings growth rate over the past 5 years. This statistic has been shown to be a reliable indicator of a firm's success and stock market performance (Amira & Hafssa, 2021; Sari & Rokhmania, 2020). This data is publicly available and was sourced from the Standard and Poor's Compustat database.

Validity can be defined as the extent to which the data collection method or research accurately represents what it was intended to measure (Bahariniya et al., 2021; Jordan, 2018; Ovan & Saputra, 2020). Reliability can be defined as the extent to which the data collection method will yield consistent results if the research was conducted by other researchers (Bahariniya et al., 2021; Jordan, 2018; Ovan & Saputra, 2020). The validity and reliability of the instruments were assessed by three tests: Content,

convergent, and discriminant validity. Content validity refers to the comprehensiveness of the items used to create each measure. The items for IT capabilities and outsourcing success have been verified for consistency via the extant literature and interviews with ITO scholars and practitioners (Han et al., 2013). Convergent validity measures the reliability of the constructs by examining the average variance of the measures. The measures yielded an average variance between 0.5 and 0.9 for all samples in the prior study by Han et al. (2013). The discriminant validity of the measures was derived from the square root of the average variance for each construct. It was shown that for each construct, this value was greater than the correlation between that construct and the other constructs, and the value ranged between 0.79 and 0.93 (Han et al., 2013).

In addition to the measures, the survey instrument had several general questions, similar to the approach used by Han et al. (2013). These questions included the length of outsourcing relationships, project size, project type, and the outsourcing vendor. A formal request to reuse the survey instrument was sent to the authors (Appendix C). I completed any training required to use the survey instrument, and all required signatures and certifications are included as part of this document. I formally requested the client financial organizations to allow targeted personnel enough time to complete the survey (see Appendix A). The survey was administered online via a secured internet service using SurveyMonkey. The survey was expected to take less than 30 minutes. The raw data was downloaded from SurveyMonkey after the survey was closed.

Data Collection Technique

The purpose of this quantitative correlational study was to determine if a significant relationship exists between vendor/client complementarity, vendor technology maturity, vendor financial stability, and ITO project outcomes. To accomplish this, I used a survey instrument for collecting primary data for vendor/client complementarity, vendor technology maturity, and ITO success. A formal letter was sent to the director of human resources for all the targeted financial institutions, briefly outlining the study, the researcher's role, and Walden University's role (see Appendix A). A follow-up communication with specific details, including the link to the online survey, was sent to each participating financial institution that agreed to participate in the study. In addition to this formal data collection technique, I also adopted a supplemental data collection technique due to slow initial responses. This supplemental technique involved using the LinkedIn professional network to publish my consent form and survey participation requests. I sent the consent form and survey participation requests to targeted groups of IT professionals in U.S. financial services.

The survey was administered online using SurveyMonkey. The online survey method is convenient for the participants and is also cost-effective and easy to administer. Online questionnaire surveys allow for the collection of large amounts of data from geographically dispersed participants in a short time frame (Ball, 2019).

The research question for this study was: Is there a relationship between vendor/client complementarity, vendor technology maturity, vendor financial stability, and ITO projects' outcome? To answer the research question, I also collected secondary

or existing data consisting of basic financial performance data on the ITO vendors. The operating earnings growth rate has been shown to be a reliable indicator of a firm's success and financial stability (Amira & Hafssa, 2021; Sari & Rokhmania, 2020). The operating earnings growth rate of the vendor firms were collected from Standard and Poor's Compustat database. Most university libraries have access to such financial databases, and I leveraged Walden University access where available.

Once the surveys were completed, the data was collected and input into SPSS analytical software. The data file is password protected and stored on a secured drive for 5 years. While online surveys are convenient and cost-effective, care must be taken that ethical principles such as privacy and confidentiality are not compromised by a third-party service provider (Evans & Mathur, 2018). To conform to the ethical principles outlined earlier, I ensured that the data was encrypted and confirmed that the third-party provider, SurveyMonkey, removed the data from their servers at the conclusions of the study.

Data Analysis

The research question for this study: Is there a relationship between vendor/client complementarity, vendor technology maturity, vendor financial stability, and ITO projects' outcome? The null hypothesis, H_0 : There is no significant relationship between vendor/client complementarity, vendor technology maturity, vendor financial stability, and ITO projects' outcome. The alternate hypothesis, H_1 : There is a significant relationship between vendor/client complementarity, vendor technology maturity, vendor financial stability, and ITO projects' outcome. Answering the research question and

testing the hypotheses required me to analyze how the three predictor or independent variables affected the dependent variable, ITO projects' outcome.

Statistical Analysis

In this study, I used multiple linear regression for statistical analysis. There are several statistical tests that can be used to analyze the relationship or correlation between independent and dependent variables. These include multiple linear regression, simple bivariate linear regression, the t-test (comparison of means), ANOVA (analysis of variance), and MANOVA (multiple analysis of variance) (Abu-Bader, 2021). With a multiple linear regression analysis, two or more independent variables can be analyzed simultaneously, with the resulting equation used to predict the score of the dependent variable (Abu-Bader, 2021). Simple bivariate linear regression, T-tests, ANOVA, and MANOVA are useful when there is only one predictor variable. Multiple linear regression is an enhancement of simple bivariate linear regression and can be used when there are multiple independent variables (Mar'I et al., 2019). In this study, I therefore used multiple linear regression since the research question involves three independent variables and how they predict the ITO projects' outcome, the dependent variable.

All three independent variables; vendor/client complementarity, vendor technology maturity, and vendor financial stability, were numeric. The first two independent variables had an interval scale with values ranging from 1 to 5. The third independent variable, vendor financial stability (represented by earnings growth), had a ratio scale, with values ranging from 0 to no maximum. The dependent variable, ITO project outcome, was also numeric and had an interval scale, with values ranging from 1

to 5. I used the multiple linear regression function in the SPSS statistical software to compute the regression analysis. SPSS is a powerful yet user-friendly statistical software package for statistical research that can perform all the above-mentioned statistical tests (Abu-Bader, 2021). Using SPSS, I also performed the correlations to determine the significance of intercorrelation between variables.

In the data analysis, I also examined the effect of each independent variable separately to determine its impact on the dependent variable, ITO project outcome. This evaluation was done by evaluating the coefficient for each independent variable from the SPSS linear multiple regression output. Using the SPSS output, I was also able to construct a simple regression equation with all three independent variables. The final predictive equation is of the form:

$$\begin{aligned} ITO \text{ project outcome} = & \text{constant value} + \text{coefficient}(\text{complementarity}) + \\ & \text{coefficient}(\text{vendor IT capability}) + \text{coefficient}(\text{vendor financial stability}) \end{aligned}$$

Interpretation of Inferential Results

Finally, I was also able to show the efficacy of the model as a whole in predicting the dependent variable. This was done by examining the R^2 of the Model Summary in the SPSS output. The R^2 , or correlation coefficient, is the proportion of the change in the dependent variable that is accounted for in the regression equation (Abu-Bader, 2021).

Data Cleaning and Missing Data

For the data cleaning process, I used the SurveyMonkey tool to prevent the participant from entering multiple responses to a question. I also used the tool to alert the user to unanswered questions to the user. Unanswered questions by a survey participant

would result in incomplete data points in the data set. These incomplete data points were discarded, and by using a large enough sample, it was expected that this would not significantly reduce the sample size, and the power will remain between 80 and 95.

Data Assumptions

There are several assumptions inherent in using statistical tests: (a) outliers in the data, (b) normal distribution of data points, (c) linearity of relationships, (d) homoscedasticity, and (e) independence of residual outliers (Abu-Bader, 2021). I used an analysis of the scatterplot and probability plot to determine if any assumptions were violated, and I employed a bootstrapping technique to mitigate any assumptions violation.

Analysis of the probability plots and scatter plots of dependent variable residuals is a useful tool to help researchers test for outliers, normality, linearity, homoscedasticity, and independence of residuals outliers (Chantarangsi et al., 2018). I therefore used the SPSS functions to generate the scatterplots and normal probability plots and analyzed the results for outliers, normality, linearity, homoscedasticity, and independence of residuals outliers. Bootstrapping is another technique which I employed when any of the assumptions were violated. The bootstrapping method involves resampling of the data with replacement to represent the actual population, a technique which can mitigate the influence of assumptions violation (Horowitz, 2019).

Study Validity

Rigor in quantitative research is achieved by validity and reliability measures which ensure that the measures properly represent the theoretical constructs. Validity and

reliability measures build trustworthiness in the study and position the study to be used in decision-making by business managers (Hall & Van Ryzin, 2019). Validity is broadly defined as the extent to which the data collection method or research findings accurately represent what it was intended to measure (Surucu & Maslakci, 2020). Reliability can be broadly defined as the extent to which the data collection method will yield similar findings and similar conclusions drawn if the research was conducted by other researchers (Surucu & Maslakci, 2020). Reliability is therefore concerned with the stability, consistency, or dependability of an instrument (Surucu & Maslakci, 2020).

Internal Validity

Internal validity is the extent to which the instruments accurately demonstrate a causal relationship in an experiment or quasi-experiment (Flannelly et al., 2018). Since this study was a correlational design and not an experiment/quasi-experiment, threats to internal validity such as selection, selection by maturation, mortality, statistical regression, testing, instrumentation, and history are not applicable. However, with a correlational analysis such as this study, the researcher is concerned with threats to statistical conclusion validity. There are three threats to statistical conclusion validity are addressed in this section: (a) reliability of the instrument, (b) data assumptions, and (c) sample size.

Reliability of the instrument measures how well the instrument avoids a Type I error. A Type I error is the probability of incorrectly rejecting the null hypothesis when the null hypothesis is true (Gohary, 2019). This type of error was mitigated by setting a robust level of significance (denoted by α -value or alpha level) for the study. A

significance of 0.05 has been used in this study, which indicates that there is only a 5% chance of committing a Type I error. The value of 5% is the most commonly used level of significance in quantitative research (Bajpai & Chaturvedi, 2021; Indrayan, 2020).

Data assumptions include normal distribution of data, linearity, homoscedasticity, and independence of residuals outliers. Analysis of the probability plots and scatter plots of dependent variable residuals can be used to test for outliers, normality, linearity, homoscedasticity, and independence of residuals outliers (Chantarangsi et al., 2018). I therefore used the SPSS generated scatterplots and normal probability plots and analyzed the results for outliers, normality, linearity, homoscedasticity, and independence of residuals outliers. I also used a bootstrapping method where data assumptions violations were discovered. Bootstrapping involves resampling of the data with replacement to represent the actual population (Horowitz, 2019).

A larger sample size increases the statistical validity of the findings (Norouzian, 2020). I used a G*Power analysis to determine the sample size to ensure statistical validity. By using a sample size larger than the minimum 59 required by power analysis, I improved the statistical validity of the findings.

External Validity

External validity is the extent to which the causal relationships in one research can be generalized to other contexts (Fabrigar et al., 2020). Research using probability (random) sampling has the greatest freedom from bias, and the resulting findings would be more externally valid (McEwan, 2020; *Selecting and Improving Quasi-Experimental Designs*, 2018). In this study, I used a non-probabilistic sampling technique in order to

target a particular knowledge base, but non-probabilistic sampling limits external validity. Additionally, the population was taken mainly from financial institutions in the United States. When the findings of a study cannot be replicated across other contexts, this could indicate the presence of a moderating variable that is specific to that other context (Fabrigar et al., 2020). Users of this study should limit the generalization of the findings to other financial institutions within the United States.

Transition and Summary

In Section 2, I outlined in detail the research methodology and design for conducting this quantitative correlational study. I also outlined my role as the researcher and the steps taken to ensure objectivity and reduce bias. Additionally, I outlined the IRB process and other steps to be taken to ensure ethical research. The rationale for choosing the participants and population and sample size were outlined. Additionally, in this section I explained in detail the *a priori* survey questionnaire instruments for vendor/client complementarity, vendor IT capability, and ITO projects' outcome. I also outlined the data collection technique: an online web-administered survey questionnaire. The data steps that will be taken to ensure the validity and reliability of the study findings were explained. I also showed the benefits of using SPSS statistical software as the analytical tool. Using a power analysis, I showed that the appropriate sample size to ensure significance of results and study validity was found to be between 59 and 90.

In Section 3, I present the data analysis results and findings. I also outline the results of tests taken to confirm study validity and reliability. Additionally, in Section 3, I show the implications for business practice, contributions to social change, and the

contribution to the academic and professional literature. Finally, I examine the limitations of this study, the opportunities for further research and present my conclusions and reflections.

Section 3: Application to Professional Practice and Implications for Change

Introduction

The purpose of this quantitative correlational study was to determine if a significant relationship exists between vendor/client complementarity, vendor technology maturity, vendor financial stability, and ITO project outcome. The predictor variables were vendor/client complementarity, vendor technology maturity, and vendor financial stability. The dependent variable was ITO project outcomes.

Presentation of the Findings

I discuss variables and data collection, statistical tests, descriptive statistics, testing of assumptions, and inferential statistical results.

Variables

The vendor/client complementarity variable (COMP) was not collected directly but is a measure of the absolute difference between the vendor IT capability (VITC) and client IT capability (CITC), similar to Han et al. (2013). Based on the assigned values of the 5-point Likert scale for both VITC and CITC, derived values for COMP ranged from one to five. Outsourcing success (OUTSC) was based on the assigned values of the 5-point Likert scale and collected directly via the survey data collection instrument. In addition to formal data collection techniques targeting leaders of financial institutions, I also adopted a supplemental data collection technique due to slow initial responses. This supplemental technique involved using LinkedIn to publish my consent form and survey participation requests. I sent consent forms and survey participation requests to targeted groups of IT professionals in U.S. financial services (see Appendix A).

Vendor operating earnings growth (VOEG) was derived from changes in operating income over a 5-year period between 2016 and 2020. VOEG was based on data from the Business Market Research Collection database. The database was used in lieu of the Compustat database, which was not available for this research.

Descriptive Statistics

A total of 75 respondents participated in this study, from which 65 surveys were completed. I performed a multiple linear regression analysis using SPSS 27 to determine the relationship between variables and test my hypotheses. Descriptive statistics for study variables are in Table 3.

Table 3

Descriptive Statistics for Study Variables

Variable	<i>M</i>	<i>SD</i>	N
COMP	4.31	0.653	65
VITC	4.05	0.881	65
VOEG	0.21	0.213	65
OUTSC	4.19	0.580	65

Tests of Assumptions

Assumptions of multicollinearity, outliers, normality, linearity, homoscedasticity, and independence of residuals were evaluated. I used statistical tests to evaluate assumptions of multicollinearity, outliers, normality, linearity, homoscedasticity, and independence of residuals. Tests include an analysis of bivariate correlations, a scatterplot of standardized residuals, and a normal probability plot. A careful evaluation of these tests shows no major violation of these assumptions.

To evaluate multicollinearity, I reviewed Pearson correlation coefficients among predictor variables. Bivariate correlations were not significant, and I therefore concluded that there were no violations of the assumption of multicollinearity (see Table 4).

Table 4

Correlation Coefficients Among Study Predictor Variables

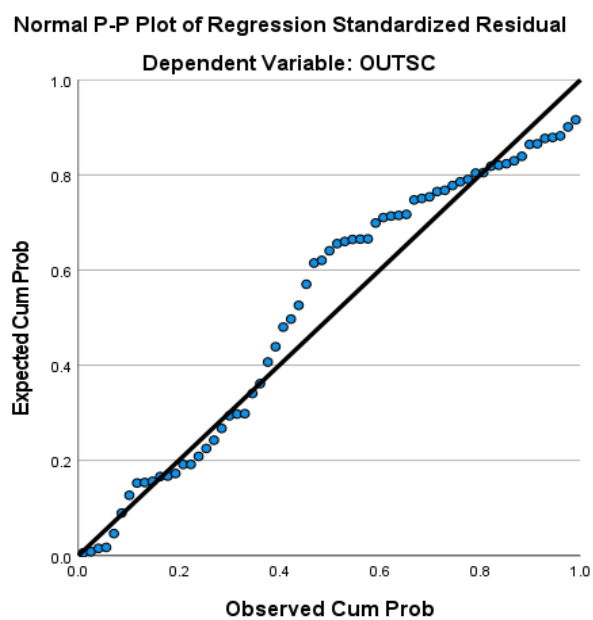
Variable	COMP	VITC	VOEG
COMP	1.000	.523	.383
VITC	.523	1.000	.250
VOEG	.383	.250	1.000

Note. $N = 65$.

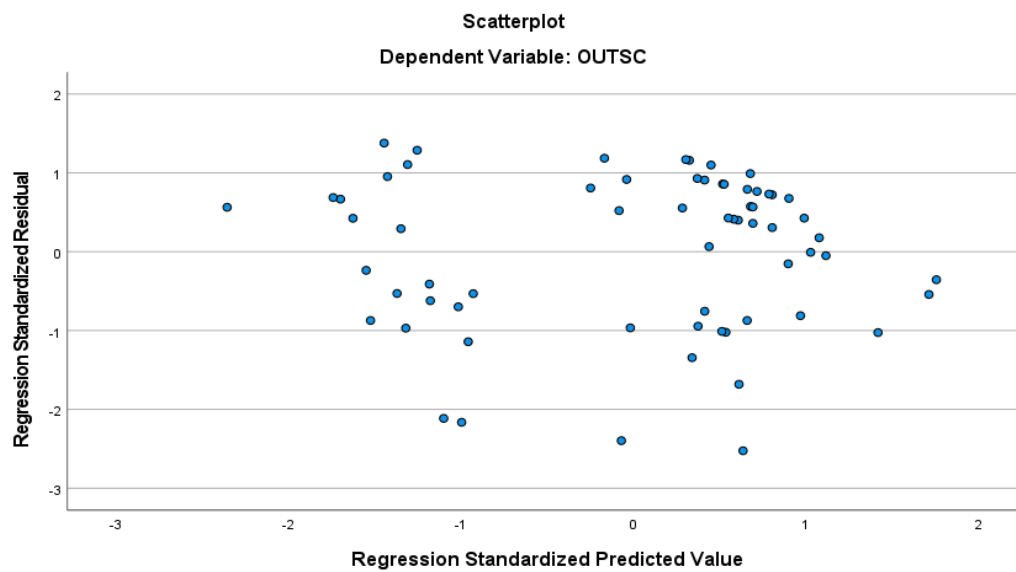
An examination of the normal probability plot (P-P) of regression standardized residuals and scatterplot of standard residuals can be used to determine if assumptions involving outliers, normality, linearity, independence of residuals, and homoscedasticity have been violated. Assumptions of normality and linearity were not significantly violated (see Figure 2). An examination of standardized residuals (see Figure 3) shows no specific pattern in terms of data points, which supports that data assumptions were not significantly violated.

Figure 2

Normal P-P of Regression Standardized Residuals

**Figure 3**

Scatterplot of the Standardized Residuals



Although most data assumptions were not significantly violated, the lack of perfect alignment in the P-P of regression standardized residuals indicates the residual variance of homoscedasticity. To mitigate this violation, I used a bootstrapping technique with 1,000 resampling and a 95% confidence interval. Bootstrap results for the coefficients were used to confirm the regression model (see Appendix D). Bootstrapped confidence intervals for the mean (M) of variables are shown in Table 5.

Table 5

Bootstrapped Confidence Intervals for Study Variables

Variable	M	SD	N	Bootstrapped 95% CI (M)
COMP	4.31	0.653	65	[4.15, 4.48]
VITC	4.05	0.881	65	[3.82, 4.27]
VOEG	0.21	0.213	65	[0.16, 0.26]
OUTSC	4.19	0.580	65	[4.04, 4.32]

Inferential Results

A standard multiple linear regression with $\alpha = .05$ (two-tailed) was used to examine the effect of vendor/client complementarity, vendor IT capability, and vendor operating earnings growth on IT outsourcing success. The independent variables were COMP, VITC as the measure of vendor technology maturity, and VOEG as the measure of vendor financial stability. The dependent variable was OUTSC, the measure of ITO projects' outcome. The null hypothesis was that there is no significant relationship between vendor/client complementarity, vendor technology maturity, vendor financial stability, and ITO projects' outcome. The alternative hypothesis is that there is a

significant relationship between vendor/client complementarity, vendor technology maturity, vendor financial stability, and ITO projects' outcome. Based on the analysis of data assumptions, there were no serious violations of the assumptions of multicollinearity, outliers, normality, linearity, independence of residuals, and homoscedasticity (see *Tests of Assumptions*). The regression model as a whole was able to significantly predict job satisfaction: $F(3, 61) = 4.845, p = .004, R^2 = .192$. The R^2 (.192) value indicated that approximately 19% of variations in outsourcing success is accounted for by the linear combination of the predictor variables (vendor/client complementarity, vendor technology maturity, and vendor financial stability). However, in the final model, only the COMP variable was statistically significant on its own with coefficients value ($t = 2.551, p = .013, \beta = .362$) accounting for a significant contribution to the model. The final predictive equation was:

$$\text{OUTS} = 2.616 + .322(\text{COMP}) + .031(\text{VITC}) + .279(\text{VOEG}).$$

COMP

The positive B value (.322) for COMP indicates vendor/client complementarity was a significant predictor of OUTSC. This means that for every 1-point increase in COMP, there was about a .322 increase in OUTSC. OUTSC tends to increase as COMP increases.

VITC

The positive B value (.031) for VITC indicates vendor technology maturity could be a predictor of OUTSC. This would mean that for every 1-point increase in VITC, there would be about a .031 increase in OUTSC. However, due to the statistically insignificant

result ($p > .005$), the effect of VITC on OUTSC is inconclusive.

VOEG

The positive B value (.279) for VOEG indicates vendor financial stability could be a predictor of OUTSC. This would mean that for every 1-point increase in VITC, there would be about a .279 increase in OUTSC. However, due to the statistically insignificant result ($p > .005$), the effect of VOEG on OUTSC is inconclusive.

Table 6

Regression Analysis Summary for Predictor Variables

Variable	<i>B</i>	<i>SE B</i>	β	<i>T</i>	<i>p</i>	<i>B</i> 95% ⁶⁷ Bootstrap CI
COMP	.322	.126	.362	2.551	.013	[.069, .574]
VITC	.031	.089	.048	.353	.726	[-.147, .210]
VOEG	.279	.340	.102	.820	.415	[-.401, .960]

Note. $N = 65.820$

Analysis Summary

Using this model, I demonstrated that the linear combination of three predictor variables does have a significant predictive power over the dependent variable. The null hypothesis was therefore rejected, and the alternative hypotheses accepted: there is a significant relationship between vendor/client complementarity, vendor technology maturity, vendor financial stability, and ITO projects' outcome. When the predictor variables were assessed individually, only vendor/client complementarity had a statistically significant effect on ITO projects' outcomes. However, while not statistically

significant, both vendor technology maturity vendor and vendor financial stability could potentially affect ITO projects' outcomes.

The positive effect of complementarity on ITO success highlights the theoretical constructs of the resource-based view since the client firm can leverage the vendors' resources to free up internal resources to focus on core competencies. This finding aligns with Rehm and Goel's (2017) study that highlighted the economies of scale that can be attained from the effective use of human and technological resources. The positive effect of complementarity on ITO success also highlighted how synergies could be achieved that are attributable to more than the sum of both vendor and client IT capabilities – a similar conclusion as drawn by Han et al. (2013). The economic benefits from cost reduction are key constructs of transaction cost theory (Ahmed et al., 2014; Jarka, 2018). The cost reductions from IT human resources are part of the ITO success measure and can be aligned with the constructs of transaction cost theory. Sen and Raghu (2013) drew upon agency theory to support their hypotheses on the need for interdependent incentives in IT outsourcing. The increase in outsourcing success as a result of the interdependence between the client and the vendor aligns with the constructs of agency theory.

Applications to Professional Practice

Two of the main benefits for firms engaging in ITO projects include gaining competitive advantage from a reduction in costs and the opportunity to free up resources to focus on core competencies and capabilities (Mehta & Mehta, 2017; Varajão et al., 2017). Additional benefits include the prevention of technological obsolescence through access to worldwide technology. These benefits are measured in the success of ITO

projects and initiatives. Business and IT leaders in the financial services industry can leverage the findings of this study to understand how complementarity and other vendor-related factors can drive that outsourcing success and allow their firms to realize the tangible benefits and maintain competitive advantage.

Financial industry leaders can utilize the concepts of client/vendor complementarity between their firm and potential vendors as part of the vendor selection process. With this study, I have been able to show the effect of a holistic approach to vendor/client ITO relationships and the synergy that comes from the alignment of vendor and client IT capabilities. In this study, I also attempted to contribute to the body of academic and practitioner knowledge by attempting to quantify the effects of complementarity on ITO success.

Implications for Social Change

Applying the practice of complementarity to IT outsourcing could mean that business leaders in financial services will need to take into consideration the IT capabilities of prospective vendors. Leveraging the study, financial services firms will realize that their IT capabilities cannot be taken in isolation if the aim is to improve outsourcing success and realize the benefits of ITO. It will behoove these financial services firms to foster an environment where potential vendors can develop their information technology capabilities to complement that of financial services clients. Vendor firms, in turn, will have an incentive to improve their information systems infrastructure as well as human resources capabilities to meet the needs of potential

clients. A better-equipped labor force and improved IT infrastructure will help to develop the local economy in the communities where the vendor firms operate.

Private firms can help to create an ecosystem of shared values by taking the holistic approach to systems development and fostering inter-organizational cooperation and innovation (Susarla & Mukhopadhyay, 2019; Yang & Yan, 2020). This shared values approach can be achieved by a strategy of complementarity where the financial services firms foster information technology capability improvements within potential vendor firms.

Economic benefits from the reduction in IT and human capital will mean that financial services firms will have more resources to invest in their community and create more opportunities to engage in corporate social responsibility initiatives. Investing in programs in the community to improve their technological capabilities and human resource is a strategy that will benefit both the communities that the firm operates and the firm itself in the long run – a strategy of shared values as outlined by Moon and Parc (2019). Creating shared values (CSV) goes beyond corporate social responsibility and allows private firms to seek out social and environmental considerations as actual business opportunities (Yang & Yan, 2020). The strategy of financial services firms investing in programs in the community aligns with the CSV concepts as outlined by Yang and Yan (2020).

Recommendations for Action

For U.S. financial services firms to realize more of the benefits of ITO, business and IT leaders should pay close attention to the fit between their firm and potential

vendors by examining the complementarity. Business and IT leaders can measure this complementarity by reviewing both the client firm's IT capability and the vendor firm's IT capabilities as a part of the vendor selection process. A high complementarity score, where both client and vendor are closely aligned, would result in a more satisfactory outcome for ITO projects.

A high complementarity score can also be achieved if both client and vendor have similar low to mediocre technology maturity scores. To achieve high complementarity and high ITO projects success, the first set of actions for a firm is to proactively monitor its IT capabilities and seek to improve those IT capabilities in areas where they are lacking. Second, the firm should seek to objectively measure potential vendors' technology maturity and ensure an alignment before considering outsourcing to a potential vendor. Specific measures of complementarity using similar instruments as outlined in the survey instruments should be built into the vendor selection process. It will be important to gain objective and unbiased ratings. It would be useful to engage a third party to collect this information. Alternatively, some of this information may be available from industry market research resources.

The effect of vendor economic stability on ITO success, although positive, was not statistically significant from this study. However, it would behoove a financial services firm to take into consideration the economic viability of potential vendors to ensure project completion.

Recommendations for Further Research

In this study, I considered only the clients' perspective since the purpose was to aid IT managers and business leaders in making more informed decisions regarding ITO vendor selection. Given the lack of confirmatory statistical significance for two of the predictor variables, a great research opportunity for further research is capturing the vendors' viewpoint with regards to their assessment of their IT capabilities and their clients' IT capabilities. Additional research capturing the vendors' perspective would help to corroborate or challenge the results presented in this study. This research would, however, require more research resources since many of the IT vendors engaged by U.S. financial services firms are located globally.

In this study, I focused on vendor-related factors such as vendor/client complementarity and its effects on ITO success. I also considered vendor technology maturity and vendor financial stability. However, there are many additional factors, vendor-related and otherwise, that also affect ITO success. Some of these factors include the regulatory environment, cultural compatibility, outsourcing history, and level of trust (Mehta & Mehta, 2017). Additional research can be done to quantify some of these additional factors and build a complete ITO success model.

Due to resource limitations and time constraints, this study used a relatively small sample population. While this sample satisfied the requirements for minimal statistical power, a larger sample and greater participation by more U.S. financial institutions would lead to stronger statistical results and more confidence in conclusions.

Reflections

Over the past 4 years, I have studied the various factors that affect ITO project's success, specifically focusing on the U.S. financial services industry. Having spent the better part of my career on the vendor side of outsourcing projects, I have seen many clients reap less than satisfactory results from their outsourcing investments. I believed that financial services clients could reap more benefits from their projects if they understood and could quantify the synergy from complementary IT capabilities between them and the vendor. I sought to further the research by Han et al. (2013) by quantifying this complementarity and applying it to U.S. financial services. I also sought to quantify the effect of other vendor-related factors such as vendor IT capability and vendor financial stability. While my main hypothesis was supported, I was hoping to get stronger correlations and statistical significance for the predictors of ITO projects outcome. I have come to appreciate that there are many factors to be considered when quantifying a predicted ITO project outcome in U.S. financial services. The scope of my project was challenging for a doctoral student with limited resources, but I am still satisfied that I can make some contribution to the body of knowledge on the subject.

Conclusion

Compared with non-IT outsourcing projects, which have a 70-80% satisfaction rating, IT outsourcing projects yield only a 33% satisfaction rating (Hanafizadeh & Ravasan, 2018b). Considering the significant resources that U.S. financial services firms commit to IT outsourcing projects, it would behoove IT and business leaders to strongly consider the complementarity fit between their firm and potential vendors to improve the

return on investments and realize the economic, technological, and strategic benefits from ITO projects.

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Appendix A: Research Participation Requests

Human Resources Department

Bank One

1 Main street

San Francisco, 91234

Dear Sir/Madam

A study on Vendor/Client Complementarity on IT Outsourcing Success

We want your help with a research study. A doctoral student from Walden University is doing a research study on how the complementary effects between vendor and client technology maturity affect the success of IT outsourcing projects in financial institutions. We want to survey managers within your IT department.

If your organization agrees to participate, the student, Everton Wilson, will send an email introducing the research purpose and link to a SurveyMonkey questionnaire. Mr. Wilson is requesting that you forward the email to your IT department managers. The questionnaire will have a qualifying question to determine if the manager is eligible for the survey. Participation will be voluntary. The survey will be anonymous, and the data will be deleted from the survey databases once the study is complete.

The survey will have approximately 40 questions and should take less than 30 minutes to complete.

Mr. Wilson's study proposal has gone through our Institutional Review Board validation, which includes training to ensure the ethical treatment of participants.

Please indicate if your organization will participate in this study. Please also state if they are any protocols for informed consent.

Dr. John Doe
Research Chair,
Walden University
john.doe@mail.waldenu.edu

Everton Wilson
Doctoral student
everton.wilson@waldenu.edu

A study on how Vendor/Client Complementarity, Vendor Technology Maturity, and Vendor Stability affects IT Outsourcing Success in Banks

Hello John Doe,

I am a doctoral student in Business Administration at Walden University, and I want your participation in an **anonymous** online survey to complete my study. If you had a role in an IT outsourcing project, I ask that you participate. The survey has 40 questions and will take about 20 minutes to complete.

I am seeking about 100 participants, and I will share my summary findings in the LinkedIn group [Banking Transformation](#) once my study is complete. I have attached the consent form for your reference. Please click on the SurveyMonkey link below to participate:

Survey link: <https://www.surveymonkey.com/r/P579QN3> (Client and vendor IT capabilities and ITO success)

Thanks for your consideration!

Appendix B: Structure of the Survey Instrument

Variable	Item	Question
<i>Client IT capability (formative second-order factor)</i>		
Technology management capability	Based on the experience in our IT outsourcing project, we think that	
	CTMC1	Our firm has the ability to standardize information technologies.
	CTMC2	Our firm has the ability to integrate various information technologies.
	CTMC3	Our firm has the ability to understand IT trends.
	CTMC4	Our firm has the ability to identify IT functional requirements.
	CTMC5	Our firm has the ability to leverage IT as a strategic competency.
	CTMC6	Our firm has the ability to update IT strategy constantly with the changes in the business environment
Organizational relationship capability	Based on the experience in our IT outsourcing project, we think that	
	CORC1	In our firm, the IT department and the management communicate well.
	CORC2	In our firm, the IT department's decisions reflect the opinions of operational users.
	CORC3	In our firm, the IT department and operational users communicate harmoniously.
	CORC4	In our firm, the IT department and operational teams trust each other.
Vendor management capability	Based on the experience in our IT outsourcing project, we think that	
	CVMC1	Our firm has a standardized process for vendor selection.
	CVMC2	Our firm has the ability to evaluate outsourcing performance.
	CVMC3	Our firm has the ability to manage outsourcing processes.
	CVMC4	Our firm has a systematic process for contract management.
	CVMC5	Our firm has a systematic process for vendor management.
<i>Vendor IT capability (formative second-order factor)</i>		
Personnel capability	Based on the experience in our IT outsourcing project, we think that	
	VVPC1	The project team members of our vendor firm have core technical knowledge necessary for our project.
	VVPC2	The project team members of our vendor firm know a methodology for conducting our project.
	VVPC3	The project team members of our vendor firm have the ability to apply related technologies to our project.
	VVPC4	The project team members of our vendor firm generally have competent technical skills.
Methodology capability	Based on the experience in our IT outsourcing project, we think that	
	VVMC1	In our vendor firm, tasks are performed with systematic methods in knowledge bases.
	VVMC2	Our vendor firm has standardized outsourcing processes to generate project outputs.
	VVMC3	Our vendor firm has the ability to solve problems systematically using area experts

Variable	Item	Question
	VVMC4	Our vendor firm has a systematic education system for project team members.
	VVMC5	Our vendor firm's methodology for our project is generally acceptable.
Client management capability		Based on the experience in our IT outsourcing project, we think that
	VCMC1	Our vendor firm sincerely shares the status of our project with us.
	VCMC2	Our vendor firm clearly understands each other's roles in our project.
	VCMC3	Our vendor firm provides us with valuable comments and feedback on our project.
	VCMC4	Our vendor firm has coordination mechanisms to solve problems with us.
<i>Outsourcing Success</i>		
		Based on the experience in our IT outsourcing project, we think that
	OUTSC1	We have been able to refocus on core business.
	OUTSC2	We have enhanced our IT competence.
	OUTSC3	We have increased access to skilled personnel.
	OUTSC4	We have reduced the human resource management cost.
	OUTSC5	We have increased efficiency in IT expenses.
	OUTSC6	We have increased efficiency in expenses.
	OUTSC7	We have reduced the risk of technological obsolescence.
	OUTSC8	We have increased access to key information technologies.
	OUTSC9	We are satisfied with our overall benefits from IT outsourcing.

Appendix C: Permission to Reuse Survey Instrument

Everton Wilson

From: 한현수 <hshan@hanyang.ac.kr>
Sent: Wednesday, September 2, 2020 8:13 AM
To: Everton Wilson
Subject: Re: Permission to reuse survey instrument

Dear Everton,

I'm pleased to approve the survey instrument used in the aforementioned paper.

Sincerely yours,
 Professor Hyun-Soo Han

2020년 8월 31일 (월) 오전 4:39, Everton Wilson <everton.wilson@waldenu.edu>님이 작성:

Professor Hyun-Soo Han
 Hanyang University
 School of Business
 17 Haengdang-Dong, Seongdong-Gu
 Seoul 133-791, Republic of Korea

hshan@hanyang.ac.kr

Dear Sir:

My name is Everton Wilson, and I am a doctoral student from Walden University writing my doctoral study titled "Relationship between Vendor/Client Complementarity, Vendor Technology Maturity, Vendor Financial Stability, and IT Outsourcing Projects' Outcome." My doctoral committee is chaired by Dr. Alexandre Lazo, who can be reached at alexandre.lazo@mail.waldenu.edu.

I would like your permission to use the *client IT capability/vendor/IT capability/Outsourcing success* survey/questionnaire instrument in my research study. This survey instrument was used in the paper "Complementarity between client and vendor IT capabilities: An empirical investigation in IT outsourcing projects" ([doi:10.1016/j.dss.2013.03.003](https://doi.org/10.1016/j.dss.2013.03.003)).

Appendix D: SPSS Output

Model Summary^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.439 ^a	.192	.153	.534229625078185
a. Predictors: (Constant), VOEG, VITC, COMP				
b. Dependent Variable: OUTSC				

ANOVA^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.149	3	1.383	4.845	.004 ^b
	Residual	17.409	61	.285		
	Total	21.558	64			
a. Dependent Variable: OUTSC						
b. Predictors: (Constant), VOEG, VITC, COMP						

Coefficients^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	2.616	.470		5.567	.000	1.676	3.555
	COMP	.322	.126	.362	2.551	.013	.069	.574
	VITC	.031	.089	.048	.353	.726	-.147	.210
	VOEG	.279	.340	.102	.820	.415	-.401	.960
a. Dependent Variable: OUTSC								

Bootstrap for Coefficients							
Model	B	Bias	Std. Error	Bootstrap ^a		BCa 95% Confidence Interval	
				Sig. (2-tailed)		Lower	Upper
1	(Constant)	2.616	-.027	.494	.001	1.539	3.409
	COMP	.322	-.005	.130	.025	.070	.547
	VITC	.031	.010	.103	.763	-.144	.281
	VOEG	.279	.072	.386	.330	-.185	1.516

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples