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Personal Decision Factors Considered by Information Technology Executives: Their Impacts on Business Intentions and Consequent Cloud Computing Services Adoption Rates

Marcus Lee Smith Jr
University of the Incarnate Word, smith373@swbell.net

PERSONAL DECISION FACTORS CONSIDERED BY INFORMATION TECHNOLOGY EXECUTIVES: THEIR IMPACTS ON BUSINESS INTENTIONS AND CONSEQUENT CLOUD COMPUTING SERVICES ADOPTION RATES

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MARCUS L. SMITH, JR.

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Marcus L. Smith, Jr.

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Marcus L. Smith, Jr., Doctor of Business Administration

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During its infancy, the cloud computing industry was the province largely of small and medium-sized business customers. Despite their size, these companies required a professionally run, yet economical information technology (IT) operation. These customers used a total value strategy whereby they avoided paying for essential, yet underutilized, resources (e.g., full-time IT personnel and computing equipment with excess capacity) by outsourcing most, if not all, of their entire IT function. Since that time, the cloud industry has expanded the breadth of its service offerings greatly and the economies of scale have reduced the unit price point. In addition, research suggests other factors are believed to exist that make a decision to execute a wholesale "rip and replace" of legacy systems difficult for today's IT executives. Accordingly, this study sought to identify factors that affect the decision-making process of IT executives when evaluating conversions of applications to cloud-based solutions. While theories such as diffusion of innovation (DOI) theory, transaction cost theory (TCT), and agency theory influenced this research, motivation theory and the technology, organization, and environment (TOE) framework made the greatest contributions to the foundation of the study.

The exploration of personal factors that influence current business intentions to adopt cloud computing services is an important research topic for several reasons. There is an implication of a strong academic and industry interest in the area from the considerable research

conducted and published concerning IT strategies related to cloud computing. Most prior research has been limited to the benefits and basic strategies behind cloud computing and related operational and financial considerations. Nuseibeh and Alhayyan's (2014) recent extensive literature review identified personal factors that contribute to the adoption of cloud computing services as a gap in current research. Prior research has not explored the personal challenges and barriers to broader acceptance of cloud technology. Furthermore, little research has addressed the specific barriers to acceptance or the specific factors considered in the decision-making process.

This study found several personal decision factors influence the decisions of IT executives regarding the selection of cloud computing services. Data collected from 189 respondents supported five of the seven hypotheses. These hypotheses state that advancement, recognition and satisfaction from accomplishments, top management support, diminishment of personal image, and pattern of technology readiness have a positive influence on business intentions to adopt cloud computing services. The diminishment of personal image finding in the current study warrants additional research to gain an understanding of its business implications.

These results may provide insights into the challenges sales organizations that cloud computing service providers face when attempting to market their offerings. Proposals that include strong, viable provisions for mitigating risks (e.g., assigning an experienced project manager to the migration project, means for ensuring data security, provisions for thorough system and performance testing, etc.) have a greater likelihood of acceptance by IT executives. The constructs in this research also contribute additions to the *nomological network* (a creation of Cronbach and Meehl [1955]) that may support future research into personal influencers of new technology decisions.

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Chapter 1: Study Description and Background

Context of Topic

During its infancy, the cloud computing industry was the province primarily of small and medium-sized business customers that required professionally run information technology (IT) operations, but at an economical cost (Prescott, 2011). These customers used a total value strategy whereby they avoided paying for essential, yet underutilized, resources (e.g., full-time IT personnel and computing equipment with excess capacity) by outsourcing, most if not all, of their entire IT function. Since that time, the cloud industry has expanded the breadth of its service offerings greatly (Kushida, Murray, & Zysman, 2011) and economies of scale have reduced the unit price point to the extent that the value proposition should have become increasingly attractive to more and larger businesses (Kappelman, McLean, Johnson, & Torres, 2015). However, according to Prescott (2011) and Smith and Gonzalez (2014), traditional service usage and market patterns remain largely in place. The Smith and Gonzalez study further demonstrated with two exceptions (Network as a Service (NaaS) and Infrastructure as a Service (IaaS)) that cloud service type usage has a correlation to company size, remaining largely the domain of small and medium-sized customers. In 2012, Gartner (Gartner puts numbers to their forecast for cloud computing, 2012) projected compounded annual growth rates of 41.7%, 26.6%, and 17.4% for IaaS, Platform as a Service (PaaS), and Software as a Service (SaaS), respectively. These services fall within the infrastructure cloud computing sub-market. These estimates appeared to suggest the growing appeal of these specific services. Low, Chen, and Wu (2011) also saw this apparent dichotomy. Considering the substantial potential financial and operational advantages and benefits touted by the broader cloud services industry, they

concluded it would be useful to discover the remaining barriers or concerns that are discouraging customers from adopting other cloud services.

Statement of Problem

Osika (2013) contended a broad demand for cloud services exists. Nevertheless, when cloud computing service providers attempt to market their services successfully, they must fully understand the personal factors driving decisions made by customer executives. Information concerning these factors would be extremely helpful for developing more complete and accurate customer profiles in order to prepare strategies for overcoming barriers and resistance.

Purpose of the Study

The primary purpose of this study was to identify the personal decision factors, aside from financial and organizational benefits, that impact the IT executive's decision to adopt cloud computing services. These personal factors included environmental considerations, perceived personal risks, and other concerns. For purposes of this study, the definition of *IT executive* was the person responsible for the development of IT strategies and the primary decision maker for related deployments. Cloud computing is a heavily researched area. However, it is worthy of further study for two reasons: (a) cloud computing technology and related societal environments are changing rapidly, consequently prior research may be dated and (b) Nuseibeh and Alhayyan (2014) identified personal factors that contribute to the adoption of cloud computing services as a gap in current research.

Research Questions

This study concerned itself with identifying potential factors that enter into the decision-making process of IT executives when evaluating conversions to cloud-based solutions and thereby influence the total level of cloud adoption. The study addressed two specific questions:

- Which personal decision-making factors have the greatest influence on business intentions and consequent cloud computing adoption levels?
- Do the personal desires of the IT executive for recognition by superiors and peers impact decision-making considerations?

Summary of Appropriate Method

Addressing the research questions in this study required an assessment of the drivers that cause an IT executive to reach a conclusion concerning the adoption of cloud computing services as a substitute for an internal provisioning of the same services. All research methods have their own strengths and weaknesses and no one method is perfect. Analysis of previous research led to the determination that a quantitative method utilizing a survey was most appropriate given the goals and settings of the research for this study. A survey is less intrusive and more generalizable than other quantitative methods and is more appropriate when trying to reach a "difficult-to-reach" population such as IT executives (see sections "Rationale for Chosen Research Method" and "Data Collection").

The survey instrument utilized questions derived from previously validated scales, the responses to which provided the dataset required for this assessment. Tashkandi and Al-Jabri's (2015) article on cloud computing adoption included 24 questions used in their instrument. Questions from this and other studies proved useful for the baseline content of the survey employed in the current study. Five-hundred fifty-six IT executives of companies located in the United States and representing various company sizes and industries received the questionnaire. The survey process produced 232 responses from qualified participants. This response count represents 43.3% of the total survey distribution.

Theoretical Framework

Multiple theories and frameworks influenced the structural model and constructs are included in this study such as TOE (Tornatzky & Fleischer, 1990; Low et al., 2011), TCT (Williamson, 1981; Nuseibeh, 2011), DOI (Rogers E., 1995; Fichman, 1992), agency theory (Eisenhardt, 1989; Young, Beckman, and Baker, 2012), and motivation theory (Deci and Ryan, 1980; van der Heijden, 2002). Chapter 2 provides explanations for these theories and frameworks.

Significance of the Study

Cloud computing is a fast-growing derivative of the traditional, mature IT outsourcing service model. Columbus (2015) projected sales growth for SaaS alone would reach $106 billion in 2016, representing a 1-year increase of 21%. He further projected a compounded annual growth rate for cloud computing infrastructure and platforms services of 30% over the period of 2013 through 2018. However, Columbus (2015) estimated a compounded annual growth rate of only 5% for overall enterprise IT expenses during the same period. This difference suggested an expectation for a strong shift in purchasing patterns by IT executives. The significance of this study came in two forms: (a) the practical aspects of a fast-growing segment of the IT service industry and (b) the advancement of critical thought in the area of the technical and personal drivers of the cloud adoption decision. The information produced by the study has enabled the sales teams of cloud computing service providers to develop improved customer sales strategies. Low et al. (2011) also expressed this contention in their study wherein they stated, "The findings offer cloud computing service providers with a better understanding of what affects cloud computing characteristics, with relevant insight on current promotions" (p. 1006). Additionally, IT executives may have found the results of the study useful when constructing their organizations' IT strategies.

Exploring factors that influence the decision to adopt cloud computing technologies was an important research topic for many reasons. There was an implication of a strong academic and industry interest in the area from the considerable research conducted and published concerning IT strategies related to cloud computing (Kappelman, McLean, Luftman, & Johnson, 2013; Kappelman, McLean, Johnson, & Gerhart, 2014; Kappelman, McLean, Johnson, & Torres, 2015; Sidorova, Evangelopoulos, Torres, & Johnson, 2013). However, most of the prior research has focused on the benefits and basic operational strategies behind cloud computing services and related operational and financial considerations. Nuseibeh and Alhayyan's (2014) recent extensive literature review identified personal factors that contribute to the adoption of cloud computing services as a gap in current research. They maintained that prior research has not explored the personal challenges and barriers to broader acceptance of cloud technology. Furthermore, little research has surfaced that addressed the specific barriers to acceptance or the particular factors considered in the decision-making process. As a result, the constructs in this research may also contribute additions to the *nomological network* (Cronbach & Meehl, 1955) and provide support for future research into personal influencers of new technology decisions.

Limitations of the Study

The population targeted for the survey conducted for this study was IT executives of companies in the United States with sizes ranging from small to enterprise dimensions. Out of consideration for the time demands placed on these executives, it was important to constrict the length of the survey to ensure that it would take no more than 10 minutes to complete. The preparation for survey execution required a careful survey design that provided the data required for analysis and recognized the standard of approximately five questions for each construct (Hair, Black, Babin, & Anderson, 2009). The development of the survey distribution list required

gathering the names of executives in small, medium, large, and enterprise sized companies, in a variety of industries, and representative of other demographic categories. Such executives are difficult to identify in quantity and, due to demands on their time, are difficult to compel to participate. Consequently, this study used multiple means for locating potential respondents.

The distribution of the survey announcement was limited to IT executives of companies in the United States to eliminate a possible source of response variation. An extension of this study to countries outside of the United States would be worthy of future research. Additionally, this study did not investigate possible correlations between the various fears and concerns identified in this study and certain demographic factors (e.g., age and gender of the executive, company industry and size, and reporting level within the organization) and cloud service types (e.g., SaaS, IaaS, PaaS, etc.) Future research into these relationships may produce greater insight about how perceived risks and benefits contribute to the decision-making process. Connections in my LinkedIn network to known IT executives at companies in the United States provided a list of 256 qualified survey recipients. These executives represented four company size categories including small, medium, large, and enterprise-sized companies. They were prequalified as the primary decision-maker for IT procurement in their respective organizations.

In the case of the snowball sampling method, the survey announcement communicated to the IT executives included a request to forward the announcement to other IT executives they deemed appropriate to take this survey. Subjected to a screening technique meant to address bias concerns was the list of initial seed participants. First, the initial sample of 256 participants were first-order connections in the author's LinkedIn network. Second, all participants were known to be qualified to respond to the request due to their positions held at their places of employment. Lastly, many of the listed contacts had participated in a previous study. The second

crowdsourcing technique (i.e., Amazon's Mechanical Turk web service) provided 300 additional executive contacts that were included in the overall distribution population.

Chapter 2: Literature Review

Major Areas of Review

When compared to other fully mature, mainstream information technology-related outsourcing service models, cloud computing remains a relatively new derivative. Consequently, as a newer form of IT outsourcing, it was appropriate to use as much specific research ascribed to cloud computing services as possible. This literature review includes the background of the cloud computing industry and previous research into the factors that influence levels of business intention to adopt cloud computing applications. Cloud computing has become an amorphous buzzword in the IT lexicon. According to Dhar (2012), "Cloud computing is the latest trend to outsource some or complete IT operations to run a business" (p. 665). It has taken on a broad set of meanings that range from what was previously referred to as *outsourced hosting* to very high-tech, specialized services for content delivery optimization, automated failovers, and disaster recovery.

Historical Background

Growing maturity of cloud computing services. In less than 10 years, cloud computing has evolved from a neophyte technology to a generally accepted IT strategy. As expansions on the long-established third-party hosting model, various forms of cloud computing services have emerged from their earliest versions in 2006 (Zissis & Lekkas, 2012). From early general purpose applications (e.g., SaaS, PaaS, and IaaS) (Mell & Grance, 2011), the breadth of offerings has grown with new, more specialized cloud computing applications such as Communications as a Service (CaaS), Network as a Service (NaaS), and Storage as a Service (STaaS). According to Mell and Grance (2011), these services have five common characteristics including: (a) on-

demand self-service, (b) broad network access, (c) resource pooling, (d) rapid elasticity, and (e) measured service.

Development of new deployment models for cloud computing. Cloud computing services come in a variety of deployment models (e.g., private, community, public, and hybrid cloud). Private cloud, as the name implies, provisions the cloud infrastructure for a single client. The client or the cloud outsourcer may own the resources in this scenario. Community cloud involves the provisioning of resources for a group of organizations with shared concerns (e.g., mission, security requirements, policies, etc.) One or more of the organizations may own and/or operate the infrastructure. In the case of the public cloud, cloud infrastructure provisioning involves multiple clients with no particular associations. The hybrid cloud is a combination of two or more distinct cloud infrastructures, bound by standardization strategies and/or proprietary technology.

Benefits and Risks of Cloud Computing

Benefits of cloud computing. While many of the direct benefits of cloud computing are related to the sharing of various necessary personnel and other IT resources and the conversion of capital expenses to operating expenses (common with the traditional outsourcing service model), cloud computing has one distinct difference. This distinction is elasticity or the pay-as-you-go model (Armbrust, et al., 2010). The cloud architecture provides *dynamic allocation* of processing and storage resources. With dynamic allocation, an automatic adjustment to resources occurs according to changing customer needs and the customer pays only for the resources actually used. In the in house scenario, the operation receives additional capacity in an incremental fashion in accordance with the projected business demand. This stair-step approach to capacity adjustments may create either of two conditions: (a) an over capacity condition where

the excess capacity represents an opportunity cost or (b) an insufficient capacity condition where company performance is impacted negatively (e.g., lost sales, lower employee efficiency, etc.) (Cloud computing for business: Building ROI from cloud computing). The timing of a hardware implementation is also important in this calculus. For example, introduction of the additional capacity too early increases the opportunity cost to the company.

Organizational risks related to cloud computing. Organizations have identified many potential risks of moving services to the cloud. Table 1 identifies many of the most common organizational risks including security breaches, vendor lock-in, loss of internal talent/resources, loss of control, risk to intellectual property (IP), regulatory compliance, and vendor financial reliability.

Personal risks related to cloud computing. In addition to the organizational risks associated with cloud computing, perceived personal risks to the IT executive exist. As Rogers (1995) pointed out, the fear appeal was associated with the personal consequences of an event, the event's likelihood of occurring, and the person's means for preventing the event. These fears are well founded. In their recent white paper, "Four reasons why CIOs lose their jobs" (2015), Silverton Consulting stated that security breaches, large project failures, availability problems, and system outages were major causes of IT executive dismissal. While full system outages in the cloud environment were less likely to occur than security breaches, large project failures, and availability problems, they were all possible. This study provided information that may prove valuable to the cloud services industry in determining the level of savings at which the IT executive begins to believe the benefits outweigh the inherent personal risks.

Table 1

Organizational Risks Associated with Cloud Computing Decisions

Risk	Description/Impact on Business
Security breaches	Breaches that exploit security vulnerabilities may lead to direct dollar losses for system repairs/restorations and possible compensations and indirect dollar losses from lost sales and market value reductions resulting from damage to the company's image and brand (Cavusoglu, Mishra, & Raghunathan, 2004).
Vendor lock-in	Vendor lock-in exists when the total costs of switching to another vendor or to an in-house solution increase to a level where it becomes financially infeasible for the customer to make the switch and becomes, in effect, locked in to the vendor. This condition shifts advantage to the vendor for future pricing, etc. (Williamson, 1981; Kiarie, 2013).
Loss of internal talent/resources	Outsourcing decisions, whether the traditional variety or cloud, normally involve shifting an organization's IT human resources to the outsourcing vendor. This leaves the customer organization without internal resources unless they elect to hire their own personnel. These personnel may duplicate outsourced resources and add to the total cost of the transaction (Williamson, 1981).
Loss of control	When vendors take over operations, they make the decisions about how tasks are completed. This includes decisions about the performance of system maintenance. Their schedules may not align with the needs of the customer (Khan & Malluhi, 2010; Kiarie, 2013).
Risk to intellectual property	As with any sensitive data (e.g., end customer and personnel data), the protection of intellectual property and company trade secrets is extremely important. Turning over governance for the security of such data requires extraordinary trust in the vendor (Johnson, 2013).
Regulatory compliance	A customer organization cannot abdicate its responsibilities for security and data integrity to a third party. For example, medical records placed in the cloud must still comply with Health Insurance Portability and Accountability Act (HIPPA) regulations. Unauthorized access violations carry stiff fines and penalties for the customer organization (Prakash, 2011; www.ama-assn.org; Kiarie, 2013).
Vendor financial viability	Should the vendor discontinue business operations, the customer organization may incur service interruptions and loss of data custody and/or availability (Kiarie, 2013).

Benefits/risk dilemma. In order to make the decision whether or not to adopt cloud computing, organizations and IT executives must determine if the benefits of the innovation

outweigh the potential risks. A contributing factor to the benefits/risk dilemma may be the inherent difficulties in estimating the true savings in a way that is acceptable to company management. Return on Investment (ROI) remains one of the standard measurements used by businesses for assessing various types of projects and investments. However, a ROI calculation to measure hard dollar savings associated with a cloud conversion may prove arguable and of limited value unless the IT assets of a going concern are approaching their end-of-life state and the change prevents a capital outlay for replacements. Rather, most of the savings appear to come in the form of productivity improvements and prevention of lost sales, two areas where calculations are more difficult to make and substantiate. While the savings and associated impact on company earnings through the use of these services can be substantial (Charterjee, 2010), the perceived risks associated with relinquishing control and compliance with a third party's directives may more than offset these savings (Neff, 2009).

Furthermore, there has been a long-standing debate on the issue of whether cloud computing savings outweigh the risks. According to Holbrook (2010), the results of her survey found only 17% of respondents indicated benefits exceeded risks while 45% (or nearly three times as many respondents) specified they did not. While researchers such as Wells, Campbell, Valacich, and Featherman (2010) have concluded inherently risky innovations carry the chance of under producing desired results, it is clear that risks to the company and the executive in such cases do not end with under-realized benefits and savings. For example, if an exploitation of a cloud solution's security vulnerabilities occurs, the direct and indirect dollar losses resulting from out-of-pocket costs and damage to company image and brand may greatly exceed any expected savings.

Relevant Theories and Frameworks

The testing of theories is an accepted method of conducting scholarly research (Creswell, 2012). To quote Kerlinger (1979), a theory is "a set of interrelated constructs (variables), definitions, and propositions that presents a systematic view of phenomena by specifying relations among variables, with the purpose of explaining natural phenomena" (p. 64). Creswell (2012) added that the propositions are, in fact, hypotheses that attempt to explain a set of relationships between variables. Labovitz and Hagedorn (1971) used the term *theorectical rationale* to describe the interrelationship of dependent and independent variables (p. 17).

Study preparation required research to identify key theories that had potential applicability to model development. The literature review revealed several theories and frameworks including TOE (Tornatzky & Fleischer, 1990; Low et al., 2011), TCT (Williamson, 1981; Nuseibeh, 2011), DOI (Rogers E., 1995; Fichman, 1992), agency theory (Eisenhardt, 1989; Young, Beckman, & Baker, 2012), and motivation theory (Deci & Ryan, 1980; van der Heijden, 2002). The descriptions of these theories and frameworks and their application to the study follow.

Transaction cost theory. Transaction cost theory (Williamson, 1981; Nuseibeh, 2011) applies to the comparison of the costs of creating a product or service by means internal or external to a firm in the context of a sourcing decision. According to the theory, the fully loaded costs of the external (outsourced) solution require a comprehensive accounting in order to form a qualified opinion on which sourcing method provides the product or service at the lowest total cost. Stemming from Commons' (1931) work wherein he contended economic activity measurements occurred properly at the transaction level, Williamson (1985) suggested the necessity for including other related transaction costs such as vendor performance monitoring and agreement enforcement. In Nuseibeh's (2011) interpretation of Williamson's work, he

contended transaction costs associated with the outsourced option should include the costs of negotiating contracts, monitoring performance, and managing the vendor relationship. Nuseibeh (2011) concluded asset specificity, lock-in concerns, and levels of uncertainty (constructs from TCT) were appropriate for his study. Han and Mithas (2013) stated their contention that hidden costs such as the cost of business process redesign within the organization were part of the total upfront cost of the migration project. They also concluded that some estimated savings were overstated, suggesting as an example, personnel costs savings when it becomes necessary to keep a limited staff resource in-house.

TCT influenced the questions included in this study's survey instrument. Full disclosure of the estimated total cost of an IT innovation is critical to maintaining a high level of trust between the IT executive and the top management of the firm. Trust and confidence are major factors in joint risk management for relational partnerships (Doloi, 2009). The existence of a trusting relationship has a direct bearing on the degree of top management support the IT executive can expect to receive for new IT initiatives.

Diffusion of innovation theory. Developed by Rogers (1995), DOI attempts to explain how and why the spread rate of new technologies differs according to various environmental elements present. He contended four factors drive the diffusion process, namely, the idea or technology itself, efficiency of communication channels, time, and a social system (i.e., the presence of influencers and the strength of social relationships). However, Rogers (1995) suggested that five characteristics of innovations provide an explanation for differing rates of adoption (see Table 2).

While relative advantage is important to the cloud computing adoption decision (i.e., it contributes to the answer of why the change is worthwhile), compatibility, complexity, and

trialability have a direct relationship to the perceived risk of a cloud computing innovation introduction in terms of user rejection of the innovation that translates into risk for the decision maker (Kiarie, 2013).

Table 2

Rogers' (1995) *Five Characteristics of Innovations*

Characteristic	Definition
Relative Advantage	Degree to which innovation is perceived as an improvement
Compatibility	Degree to which innovation is consistent with existing values and norms
Complexity	Degree to which innovation is perceived as difficult to comprehend and/or use
Trialability	Degree to which innovation is capable of being tested on a limited basis
Observability	Degree to which innovation results are visible

Rogers (1995) described DOI as a special form of communication inasmuch as it relates to the dissemination of new ideas and emphasized the role of the DOI process in reducing uncertainty. Fichman (1992) expanded on the notion of diffusion indicating the theory was "developed in the context of adopters making voluntary decisions to accept or reject" a new technology based on its associated value (p. 1). Barrowing on other research, he suggested other factors influence the degree of adoption such as encouragement (Leonard-Barton & Deschamps, 1988) or mandate by management (Moore & Benbasat, 1991). Fichman (1992) further contended diffusion theory provides tools that are adaptive to qualitative and quantitative research. Al-Zoubi (2013) combined the constructs of the DOI model with Tornatsky and Fleischer's (1990) TOE model. See Table 3 for Al-Zoubi's (2013) construct sources.

The survey used for this study reflected various precepts of DOI. The strength of social relationships was an important element in developing the questions related to the pattern of technology readiness construct. DOI's stated role in reducing uncertainty connected logically to the risk mitigation thread that ran through multiple constructs.

Table 3

Al-Zoubi (2013) Model's DOI and TOE Sourced Constructs

DOI	TOE
Innovation Characteristics	Technology
Relative advantage	Available characteristics
Compatibility	Organization
Complexity	Size
Trialability	Slack
Observability	Structures
Organizational Characteristics	Communication
Centralization	Environment
Complexity	Industry characteristics
Size	Technology support infrastructure
Slack	Government regulation
Formalization	
Interconnectedness	

Agency theory. Agency theory describes the essence of the sometimes-antagonistic relationship between a principal and an agent. In a business setting, examples of this type of relationship include manager/employee (principal/agent) and shareholder/corporate management (principal/agent). The underlying principle of agency theory is that people act in their own best interest. However, unlike the theory of reasoned action (TRA) (Ajzen, 1985), the behaviors involved in an agency relationship may not always be voluntary. More specifically, according to Eisenhardt (1989),

> Agency theory is concerned with resolving two problems that can occur in agency relationships. The first is the agency problem that arises when (a) the desires or goals of the principal and agent conflict and (b) it is difficult or expensive for the principal to verify what the agent is actually doing. The problem here is that the principal cannot verify that the agent has behaved appropriately. The second is the problem of risk sharing that arises when the principal and agent have different attitudes toward risk. The problem here is that the principal and the agent may prefer different actions because of the different risk preferences. (p. 58)

Young et al. (2012) stated in relationship to financial incentives in a pay-for-performance situation, the agent is "assumed to be risk averse" (p. 965). Contrary to workers in other fields,

professionals tend to counterbalance the desire for financial rewards with the values and norms associated with their field of endeavor. Young et al. (2012) also concluded that in a professional setting, once the performance outcomes and means for measurement have been determined, risks transferred largely from the principal to the agent.

The "for this, you get that" nature of agency theory influenced the set of personal incentive constructs contained in the study conceptual model. Young et al.'s (2012) research helped explain the relationship of the agent's perception of associated risk to the monetary incentives and advancement constructs. The trade-off between risk and reward likely influenced the responses to the survey questions involving these constructs.

Motivation theory. While agency theory explains behavior, motivation theory helps explain and predict behavior. Consistent with this theory, motive is an element that prompts the behavior of the individual, sometimes as a consequence of experiences. Motivation theory is a heavily studied field of psychological research. More recently, researchers such Deci and Ryan, van der Heijden, Dewett, and Cabanac have made significant contributions to the total body of work.

Deci and Ryan (1980) found that "intrinsically motivated behaviors are those behaviors that are motivated by the underlying need for competence and self-determination" (p. 42). However, they suggested a clarification of the definition was necessary for the purpose of their research inasmuch as external contingencies did not affect these behaviors. They concluded also that concerns over job preservation grow with the executive's age to the point that the fifty-and-older group were practically unemployable. This concern may heighten personal fears over the potential of a decision failure. Furthermore, van der Heijden (2002) found:

> Upward mobility, in particular, seems to be impossible for many older workers. Fifty-five percent of the employees of 40-52 at the middle level and 40 percent of those at a higher level are considered by their superior to be at "the top of their ability." (p. 48)

Without the motivation of potential advancement, executives in this age group may determine risk taking in the form of introducing a radically new or different technology may be unwise from a personal standpoint.

Incentives may also come in negative forms such as fear. Dewett (2007) found in a study of 165 research and development personnel and their supervisors that intrinsic motivation, the value of which he cited from Deci and Ryan (1980), "mediates the relationship between certain antecedents and one's willingness to take risks" (p. 197). Specifically, Dewett (2007) determined a relationship exists between intrinsic motivation and encouragement and creativity, self-efficacy, and risk taking. Finally, Cabanac (1992) suggested sensory pleasures provided a common *motivational currency*. Cabanac (1992) further believed there was an unambiguous relationship between this sense of personal joy and one's sense of usefulness. Consequently, he advocated the inclusion of sensory factors in an analysis.

Motivational theory provided the foundation for several questions in the study survey associated with the perceived personal incentives and fears constructs. Deci and Ryan's work was critical to assigning the connection between motivations and risks. Cabanac's work provided a connection between motivations and sensory pleasures, elements often associated with experiencing personal satisfaction. The personal expectations created through a motivation theory related understanding between job satisfaction and other study constructs was included in the consideration of investigating for the presence of mediating conditions in the study's model.

Technology, organization, and environment framework. TOE is one of the most used frameworks employed in the area of technology adoption. First developed by Tornatsky and Fliesher (1990), it described factors that influence technology adoption decisions within three

primary contexts: (a) technology, (b) organization, and (c) environment. The technology context referred to the equipment, software, and processes related to a particular innovation. The organization context included characteristics and cultural influences associated with a firm (e.g., company size, industry, attitudes towards innovation, etc.) The final context, environment, involved the setting in which the technology is implemented. This context took into consideration the firm's competitors, the size of the firm's industry, regulatory issues, etc. Descriptions of several studies employing the TOE framework are included in "Applicable Framework and Structure-related Studies." The studies cited are Low et al. (2011)**,** Tashkandi and Al-Jabri (2015), Rai, Sahoo, and Mehfuz (2015), and Nuseibeh (2011).

Cloud Computing Research

Related cloud computing technology research. Cloud computing is a fast-growing industry that is attracting considerable attention from the research community. Included in this research are the works of Yigitbasioglu, Mackenzie, and Low, Dhar, and Wang. Yigitbasioglu Mackenzie, and Low (2013) stated clearly their conclusion, defining cloud computing as "an enabler of information technology outsourcing whereby access to IT resources such as software, hardware, and platform are delivered over the Internet as a service" (p. 101). They confirmed that a per-use charge was the basis for pricing cloud services. Dhar (2012) suggested that the migration from traditional IT outsourcing to cloud computing services has been evolutionary; that cloud computing was simply the latest progression in the long-term trend. Dhar (2012) also provided the following definition of IT outsourcing:

> IT outsourcing is an act of delegating or transferring some or all of the information technology related decision making rights, business processes, internal activities, and services to external providers, who develop, manage, and administer these activities in accordance with agreed upon deliverables, performance standards and outputs, as set forth in the contractual agreement. (p. 664)

By this definition of IT outsourcing, it is apparent he found a close, symbiotic relationship between IT outsourcing and cloud computing concepts. Kaur and Singh (2012) reached a similar conclusion, suggesting cloud computing was an advancement on original IT outsourcing model. Wang (2012) concurred, indicating cloud computing was a more economical version of the traditional outsourcing model.

Related cloud computing adoption research. Substantive prior research in this area may have relevance to the subject of this study. De La Hera (2013) determined the primary driver for using cloud computing was the reduction of infrastructure costs. De La Hera (2013) elevated cloud computing from a simple short-term tactic to a full-fledged IT strategy. In so doing, she suggested that cloud computing had emerged from technology fad status to a solid trend. Osika (2013) strengthened this conviction with the observation that businesses of various sizes were becoming cloud computing service customers. According to Osika (2013), "cloud consumption models are gaining traction" (p. 1). Low et al. (2011) discovered that relative advantage, firm size, top management support, competitive pressure, and trading partner pressure were significant determinants of cloud computing adoption. In the same publication, Low et al. (2011) stated that despite the advantages and benefits of cloud computing, the adoption rate for such services "is not growing as fast as expected" (p. 1007). Personal factors not examined in the Low et al. study suggest an explanation for these outcomes and may give cloud service providers information essential for developing a successful sales strategy for companies of all sizes.

Survey Instrument Research

The literature review found several surveys that addressed various factors and issues associated with cloud computing service usage. However, only one survey concerned itself with factors outside of savings and enhanced capabilities. The survey (Survey on cloud computing,

2014) proved helpful in ensuring the new instrument addressed personal concerns such as career risks and the views of the IT executive's peers. Tashkandi and Al-Jabri's (2015) cloud computing adoption article included 24 questions used in their instrument. These questions proved useful for developing the baseline aspect of this study. Kappelman et al. (2015) provided a copy of their work with the Society for Information Management. Their survey had a high success rate in terms of response rate and contained many questions considered for this study's questionnaire. Finally, a website (Industry sectors, n.d.) provided the primary source of the industry sectors used in the gathering of demographic data. The "Non-profit Organization" sector augmented the website list to accommodate respondents representing this category of firms. The sectors, "Other" and "Choose Not to Disclose," completed the industry sector list for respondents not affiliated with any of the other sectors or desiring additional anonymity.

Applicable Framework and Structure-related Studies

Research revealed several studies that used concepts from TOE, DOI, TCT, and other theories/frameworks for the basis of their model structures. These models, in turn, provided guidance during the development of the conceptual model for this study. Cloud computing services was the subject of all of the studies.

Low et al. Low et al. (2011) employed the TOE framework (Tornatzky & Fleischer, 1990) and identified certain factors as determinants of cloud adoption and predictors of success in developing their model. In the technology factor cluster, they included constructs for relative advantage, complexity, and compatibility. The organizational factor cluster included constructs for top management support, firm size, and technology readiness. The final factor cluster, environment, contained constructs for competitive pressure and trading partner pressure. As it "provides a useful analytical framework that can be used for studying the adoption and

assimilation of different type of IT innovation," TOE was an appropriate framework for a study of this type (Oliveira & Martins, 2011, p. 112). The three hypotheses assigned to the technology group involved three of the five attributes found in Rogers' (1995) DOI theory, namely (a) relative advantage, (b) compatibility, and (c) complexity. As cloud computing was an example of a disruptive technology, the application of this theory to cloud computing was fitting.

The design of the Low et al. model tested eight hypotheses. Five of the hypotheses found significance at different thresholds (see Table 4).

Table 4

Low's Supported Hypotheses (Low, Chen, & Wu, 2011)

Hypothesis	Description	*p*-value Threshold
H_1	The adoption rates for cloud computing services and relative advantage have a positive correlation	$p < .05$
H_4	The adoption rates for cloud computing services and top management support have a positive correlation	$p < .05$
H_5	The adoption rates for cloud computing services and firm size have a positive correlation	$p < .05$
H_7	The adoption rates for cloud computing services and competitive pressure have a positive correlation	$p < .05$
H_8	The adoption rates for cloud computing services and trading partner pressure have a positive correlation	$p < .01$

While H_1 achieved significance, it was determined that relative advantage had a *negative* correlation to cloud adoption. This finding was inconsistent with other studies such as Tan, Lin, and Eze (2008), To and Ngai (2006), and Wang, Wang, and Yang (2010). Low et al. (2011) suggested the number of non-responses they incurred in the survey process may have biased the outcomes of their study.

While the constructs of Low et al. (2011) study were associated with company and technology-related factors specifically for high-tech firms, some of their findings had applicability to personal influencers. According to the study, the trading partner pressure factor

had a positive correlation with cloud adoption and was transferable to industry peer pressure. An argument is possible that this peer pressure is associated further with an IT executive's concern for diminishment of personal image. Another construct in the Low et al. (2011) study (top management support) related to a company's cultural environment factor that embraces change and had a positive correlation to cloud adoption. Similarly, Espadanal and Oliveira (2012) found a reluctance for businesses to move to the cloud when a lack of management support and technology readiness and perceived complexity, privacy, and security concerns existed.

Tashkandi and Al-Jabri. Tashkandi and Al-Jabri (2015) also employed TOE in their study of cloud computing technology adoption by higher education institutions in Saudi Arabia. The assertion that "cloud computing is one of the top 10 strategic technology trends for 2014" provided motivation for their study (p. 1528). They repeated many of the constructs contained in Low et al. (2011) such as relative advantage, complexity, management support, and peer pressure. After receiving responses from 34 educational institutions, the authors concluded that relative advantage and top management support had significant positive effects on adoption. They further determined that complexity and data concern (i.e., security) had significant negative effects on adoption. The remaining factors were insignificant.

Rai et al. In Rai et al. (2015), the authors developed a systematic approach to scanning libraries for literature containing prior research using a list of cloud-related keywords developed from the results of a questionnaire posted on LinkedIn and various blogs dedicated to cloud and cloud migration. In the end, the study produced the equivalent of an annotated bibliography of primary studies and their key findings. Among these findings was the identification of four key factors for migration: (a) cost savings, (b) efficient resource utilization, (c) unlimited scalability of resources, and (d) less maintainability. While the Rai et al. (2015) did not identify them as

such, many of the factors they listed as migration challenges were also included in the TOE framework. Among these factors were data security (i.e., data concern), complexity, and technology readiness.

Nuseibeh. In his model, Nuseibeh (2011) organized his constructs according to the three theories he employed, namely TCT, Resource Dependence Theory (RDT), and DOI. He included three constructs derived from TCT (i.e., asset specificity, lock-in concerns, and uncertainty) and selected various constructs from the other theories, namely (a) importance of the resource and degree of control over IT resource (from RDT), (b) relative advantage, perceived complexity, organizational innovativeness (DOI), and (c) level of uncertainty of demand and security (from an undisclosed theory). Nuseibeh (2011) concluded "cloud computing may not be a silver bullet" inasmuch as the benefits were dependent largely on a good implementation (p. 7). Conversely, he continued, a bad implementation "can lead to economical loss, loss of reputation in cases of interruption of services, or data loss/theft" (p. 7).

Chapter 3: Research Method

Rationale for Chosen Research Method

The two most widely accepted research techniques are the quantitative and qualitative methods. Westat (2002) contended that both methods had a role in research and that the data required to answer the research questions drove the selection process. "Quantitative and qualitative techniques provide a tradeoff between breadth and depth and between generalizability and targeting to specific (sometimes very limited) populations" (p. 43). In order to address the research questions posed by the current study, a broad dataset in terms of the number of data points and participant responses was necessary to establish credibility. This need suggested a requirement for a highly generalizable, non-abstract research approach. Consequently, the quantitative method appeared to provide a better fit.

Hollingshead and Poole (2012) suggested another factor worthy of consideration when making the final research method selection. That consideration was the special qualities of group studies contrasted with those of individual studies. In their discussion of this topic, they noted the definition of "group" had changed dramatically with the advent of various new social media that had resulted in the formation of new types of relationships with varying levels of influence. They further suggested that the nature of the research question guided the direction taken for a group study and that research questions derived from mature theory were inclined to describe associations between established constructs. Additionally, "hypothesis testing using quantitative methods is a more powerful approach for research questions based on mature theory" (p. 5). In the final analysis, the research method used should be relevant to the research question and rigorous in its implementation. This contention supported further my decision to use the quantitative method.

Data Collection

Data collection techniques. McGrath and Runkel (1972) developed a highly recognized work on the subject of behavioral sciences research. Among other tools and concepts, they included the *McGrath Wheel,* a model for analyzing research methods. Referring to the wheel, McGrath and Runkel (1972) stated there was no single best method, contending that each had inherent strengths and weaknesses. Thus, the selection process itself retained significant importance. In a later publication, McGrath (1994) referred to his previous research and the eight alternative research strategies or environments and suggested a two-step process for selecting the most appropriate strategy or environment for a particular study. The first step required the researcher to analyze their study environment in terms of the two axis continuums (concrete vs. abstract and obtrusive vs. unobtrusive). The concrete vs. abstract axis was an assessment of the degree to which the setting was universal (i.e., abstract) or particular (i.e., concrete). The obtrusive vs. unobtrusive axis involved a determination of the degree to which the strategy used procedures that would interfere with ongoing human activities. In the second step, the researcher was to consider, relative to the desired outcome of the study, three so-called A-B-C criterion (i.e., generalization, precision, and realism). According to McGrath (1994), the simultaneous maximization of all three criterion was not possible.

Using this two-step process, I first concluded that the setting of the study was more concrete than abstract and that the strategy would require obtaining information directly from the principals involved in the decision-making process. Out of necessity, the strategy would require a moderately intrusive procedure that had to respect the time pressures of these executives. These assessments placed this study in the concrete/obtrusive quadrant of the wheel, narrowing the choices from eight to two. In the second step, the researcher concluded that the desired outcome

for the study was to be as general in its applicability as possible. The employment of the A-B-C criteria from McGrath's process caused me to conclude the survey option was preferable.

Additional research found another tool for selecting a data collection technique. According to Westat (2002), three data collection techniques were applicable to quantitative studies, namely, (a) tests, (b) document studies, and (c) surveys. While tests may take many forms, they all assessed the subjects' knowledge and ability to apply that knowledge within a context. Document studies referred to a method for gathering information from the examination of written or recorded materials and databases. Surveys were widely used, structured means for collecting responses to questions designed to produce the data required by a specific study. Each technique had its own strengths and weaknesses (see Table 5).

The analysis of the three techniques produced a conclusion that the testing technique, aside from the impracticality of reaching the targeted population, would not provide a fit with the purpose of this study. Document and dataset studies were applicable to this study. However, as Table 5 suggests, they may have been difficult to locate and considering the pace at which the cloud computing industry is changing, the data contained in the datasets may have become dated and therefore of questionable value. Using Westat's work, I considered three critical factors in the selection of the survey technique for this study: (a) careful construction of survey questions could provide the precise data (including contextual data) needed to test study hypotheses, (b) data produced by the survey would be current, and (c) surveys provide greater control over the data collection process. The weaknesses of this technique were mitigatable through the questionnaire design and sampling techniques. The outcomes stemming from McGrath's and Westat's methods provided confidence that the survey technique was superior to other options.

Table 5

Advantages and Disadvantages of Quantitative Data Collection Techniques (Westat, 2002)

Technique	Strengths	Weaknesses
Tests	• Provide objective information • Format and contents are flexible • Scoring is straightforward • Widely accepted credibility	• May be: ▪ oversimplified and superficial ▪ time consuming ▪ biased against some groups of test takers ▪ subject to corruption from outside influences
Document studies	• Available locally • Inexpensive • Grounded in setting and language • Useful for determining value, interest, positions, political climate, etc. • Provide historical trend information • Provide trend study information • Unobtrusive	• May be: ▪ incomplete ▪ inaccurate or of questionable authenticity ▪ difficult to locate and access ▪ time consuming to locate and analyze ▪ out-of-date data
Surveys	• Good for gathering descriptive data • Can cover a wide range of topics • Provide design flexibility for crafting questions that align with the specific needs of a study • Collected data is current • Give survey operator greater control over the data collection process and the ability to select specific survey distribution methods • Relatively inexpensive to use • Results can be analyzed using a variety of software tools	• Self-reporting may lead to biased analysis • Data may be superficial • May not provide adequate information on context

Sampling techniques. A combination of crowdsourcing (see section "Crowdsourcing" for a definition and background) and a direct personal appeal provided the means for the survey announcement circulation. Two primary sources provided the survey distribution list: (a) a crowdsourcing website (Amazon's Mechanical Turk) and (b) a list of 256 individuals from the

researcher's LinkedIn network connections who satisfied the qualifications of the study. The LinkedIn connections also provided the seeds for the snowball sampling method.

Research Objectives

Nuseibeh and Alhayyan's (2014) recent extensive literature review identified personal factors that contribute to the adoption of cloud computing services as a gap in current research. This observation supported the notion that prior research had not explored the personal challenges and barriers to broader acceptance of cloud technology. Considering the growth anticipated for the cloud computing industry and the potential benefits of cloud-based services, the primary objective of this study became the identification of the personal decision factors that influence IT executives and business intentions when deciding whether to use these services.

Overall Approach and Rationale

Using the work of Westat (2002), Hollingshead and Poole (2012), and McGrath and Runkel (1972), the most appropriate approach for this study was the quantitative research method utilizing a sample survey. This approach was appropriate given the goals and objectives of the study. The survey instrument, reflecting researched theories and frameworks, provided the necessary data to perform a quantitative analysis. The pathway loading provided by the Partial Least Squares (PLS) regression proved highly useful in determining the strength of relationships. Data was analyzed using SmartPLS (Ringle, Wende, & Will, 2005), a partial least square, structural equation modeling (PLS-SEM) tool. PLS-SEM has been determined appropriate for studies in the exploratory stage as the one described in this study (Hair, Hult, & Ringle, 2016).

Theoretical Development and Hypotheses

The hypotheses employed in this study are contained in Table 6.

Quantitative Research Variables

Independent variables. The independent variables in the quantitative study were ordinal scale values provided by survey responses describing potential decision factors. Questions related to the independent variables employed a 5-point Likert scale.

Dependent variable. It was necessary to create a variable (TOTAL_BI) as a scale variable.

Table 6

Study Hypotheses

Hypothesis	Description
H_1	Monetary incentives have a positive influence on business intentions to adopt cloud computing services
H_2	Advancement opportunities have a positive influence on business intentions to adopt cloud computing services
H_3	Recognition and satisfaction from accomplishments have a positive influence business intentions to adopt cloud computing services
H_4	Job termination or demotion has a negative influence business intentions to adopt cloud computing services
H_5	Diminishment of personal image has a negative influence business intentions to adopt cloud computing services
H_6	Top management support has a positive influence business intentions to adopt cloud computing services
H_7	Pattern of technology readiness has a positive influence business intentions to adopt cloud computing services

Conceptual Model

The model and constructs used in this study represented an influence of multiple theories and frameworks namely: (a) TOE (Tornatzky & Fleischer, 1990; Low et al., 2011); (b) TCT (Williamson, 1981; Nuseibeh, 2011); (c) DOI (Rogers E., 1995; Fichman, 1992); (d) agency theory (Eisenhardt, 1989; Young et al., 2012); and (e) motivation theory (Deci & Ryan, 1980; van der Heijden, 2002). The conceptual model employed in this study used elements of TOE, specifically the top management support and pattern of technology readiness constructs. The

other relevant theories influenced directly and indirectly the remaining constructs as well as the survey questions. The conceptual model employed in this study is included in Figure 1.

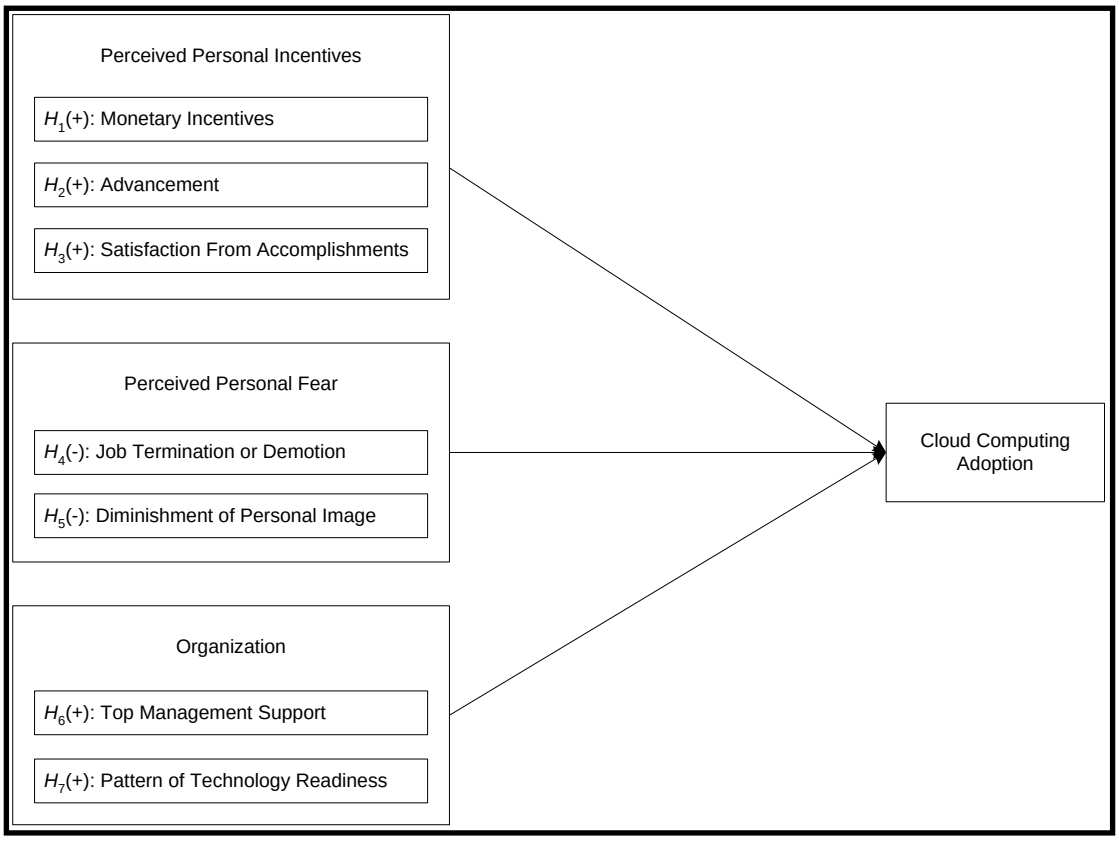


Figure 1. Conceptual model for influencers of cloud computing adoption.

The conceptual model included three clusters of related factors: (a) perceived incentives, (b) perceived personal fears, and (c) organization. Various sources provided the factor clusters used to develop this model (see Table 7). Each cluster entailed a group of factors (constructs) used in this study. The model itself represented a synthesis of these sources.

Perceived personal incentives. Three constructs, namely monetary incentives, advancement, and recognition and satisfaction from accomplishments, were included in this cluster. Gagne and Deci (2005) stressed the importance of monetary incentives, including raises due to advancement, as an important extrinsic motivator. They also suggested that interest in the task was a key intrinsic motivator. In that respect, it could be argued that satisfaction or pleasure

created through task accomplishment is a factor in the continued interest in such tasks. Masson (1971) submitted that key job characteristics including salary, status (a form of recognition), and task challenge could be associated with job satisfaction.

Table 7

Sources of Model Factor Clusters

Factor Cluster	Source(s)
Perceived personal incentives	Agency theory and motivation theory: Eisenhardt, 1989 Young et al., 2012 Deci and Ryan, 2012 Gagne and Deci, 2005 Masson, 1971
Perceived personal fears	Motivation theory: Bendovschi, Tinca, Ionescu, and Plescan, 2014 Rogers R. , 1975 Dewett, 2007
Organization	Technology, organization, and environment framework: Tornatzky and Fleischer, 1990 Low et al., 2011 Oliveira and Martins, 2011

Risks, both general and specific, appeared to be a common element for these constructs. In relationship to financial incentives in pay-for-performance situations, Young et al. (2012) suggested the agent would be averse to risk if it reduced their opportunities for satisfying the agreement. In the same study, they also submitted that once the performance outcomes and means for measurement had been determined, risks transferred largely from the principal to the agent. This assignment of responsibility for risk to the individual would prove useful in explaining a reluctance to taking on difficult or complex challenges. Eisenhardt (1989) concurred with this conjecture, indicating her belief that another consideration was present in agency situations, namely the problem when the principal and the agent prefer different actions because

of different risk preferences. Deci and Ryan (1980) also spoke to the link between motivations and risk, suggesting a requirement for self-determination as an essential element for external motivation effectiveness. However, Eisenhardt (1989) emphasized the notion that outcome-based incentives led to greater achievements consistent with agency theory. Accordingly, I proposed:

- H_1: Monetary Incentives have a positive influence on business intentions to adopt cloud computing services,
- H_2: Advancement Opportunities have a positive influence on business intentions to adopt cloud computing services, and
- H_3: Recognition and Satisfaction from Accomplishments have a positive influence on business intentions to adopt cloud computing services.

Perceived personal fears. This cluster included two constructs: job termination or demotion and diminishment of personal image. Bendovschi et al. (2014) suggested perceived fears were key in the decisions regarding cloud adoption where the respondents compared benefits to risks. Decisions with low inherent risks or plausible risk mitigators received the highest preferences for the cloud solution. The data custody factor, with high-perceived risk and associated exposure, received the highest score for an in-house solution.

Rogers (1975) associated this fear appeal with personal consequences of an event, the event's likelihood of occurring, and the person's means for preventing the event from occurring. Rogers (1975) further suggested the personal consequences aspect of the appeal was heighted if the person had experienced similar consequences in the past. Dewett (2007) found similarly that intrinsic motivation serves as a mediator between avoidance learning due to history and a person's willingness to take risks. This cluster related to the consequences aspect of the fear appeal. Therefore, based on prior studies, I proposed:

- H_4: Job Termination or Demotion has a negative influence on business intentions to adopt cloud computing services and
- H_5: Diminishment of Personal Image has a negative influence on business intentions to adopt cloud computing services.

Organization. This cluster included two constructs, top management support and pattern of technology readiness. Both of these constructs were included in the organization factor cluster developed by Tornatsky and Fleischer (1990) for their TOE framework. Oliveira and Martins (2011) recognized the significance of Tornatsky's and Fleicher's (1990) framework for its usefulness in studying adoption of various types of technology. Low et al. (2011) also used TOE for the basis of their model.

Low et al. (2011) had additional significance for the current study. Their study was focused specifically on cloud computing. Their technology research occurred in 2011 as cloud computing was emerging as a mainstream strategy. Their TOE organization factor cluster contained three constructs: top management support, company size, and technology readiness. In the end, Low et al. (2011) found support for two of their hypotheses: (a) the adoption rates for cloud computing services and top management support had a positive correlation and (b) the adoption rates for cloud computing services and firm size had a positive correlation. The data did not support their third hypothesis, a positive correlation between technology readiness and cloud adoption. Due to its specific nature, this study included the top management and technology readiness constructs in the organization factor cluster. Consequently, due to prior studies, I proposed:

- H_6: Top Management Support has a positive influence business intentions to adopt cloud computing services and

- H_7: Pattern of Technology Readiness has a positive influence on business intentions to adopt cloud computing services.

Survey Construction and Data Analysis

A review of the survey prior to conducting a pilot study ensured that the questions accurately represented the model's constructs. Adjustments, where necessary, commenced following an analysis of the information collected from participants in the pilot study for construct reliability and validity. The survey consisted of questions that were easily answerable by the subjects without research. Consequently, the information collected from the 98 respondents to the pilot survey showed the survey would take no more than 10 minutes to complete.

The sources of these questions came from previously validated scales. Several survey beta tests conducted prior to the pilot survey proved the soundness of the survey structure. These tests confirmed the branching logic and the full range of data entries worked properly. Surveymonkey.com hosted, produced, and conducted the pilot and primary surveys. Recipients identified through Mechanical Turk and personal LinkedIn connections with a prerequisite background permitting them to understand and respond to the questions appropriately underwent a pre-selection process before receiving the primary survey.

Protection of Human Subjects: Ethical Considerations

The UIW Institutional Review Board Permission granted permission to conduct the survey associated with this study. CITI training provided the researcher certification previously (see Appendix B). This study requested survey responses from known adult-aged executives as determined by the answer to a survey question on the first introductory page of the survey (i.e., "Are you 21 years of age or older?") The survey design immediately exited participants who

responded “no” to the age question. Participation in this study was strictly voluntary and each participant (i.e., subject) was asked to indicate their willingness to participate in the electronic survey through the introduction page of the survey. This page served as the equivalent of a signed consent form and consisted of the language contained in the Consent to Participate Letter (see Appendix A). The survey design immediately exited participants who respond “no” to the willingness to participate question. This language also included an explanation of the purpose and benefits of the study and the role and time commitment, estimated at no more than 10 minutes. Participants received assurances that their data would retain its anonymity.

During and after the study period, the confidentiality and anonymity of study data received protection. The study data collected did not include names and other personal information. Assurances given to the participants stated company-related data collected would not be identifiable. The survey associated with this research study did not ask the subjects questions of a sensitive nature. There was no physical risk or expense related to participating in this study. The survey design allowed participants to discontinue taking part in the survey at any time.

Chapter 4: Data Analysis

Data Collection Process

Two primary techniques provided the means for distributing the survey: (a) two crowdsourcing methods including the snowball sampling method and Amazon's Mechanical Turk web service and (b) a personal LinkedIn network of 256 connections known to satisfy the qualifications of the survey. The LinkedIn service provided the means for e-mailing connections in the subscriber's network. This process mirrored the traditional approach to mailing hard-copy surveys to prospective respondents and, as an online service, performed the task at real-time speeds for little or no cost.

Croudsourcing. Crowdsourcing as a response development method is an emerging concept that is rapidly gaining interest and support in the research community. The survey distribution process used two forms of *crowdsourcing*: the snowball sampling method and Amazon's Mechanical Turk web service. Crowdsourcing and its derivative (crowdfunding) are methods for obtaining information, human intelligence, funding, etc. from large groups of participants through online means. It replaces previous methods that relied upon reaching relatively small samples of people and/or investors directly. Crowdsourcing is gaining rapid acceptance as a means for obtaining qualified solicited data contributions such as those required for this study. Arch and Carr (2016) recently concluded, "online crowdsourcing represents a feasible, efficient, and cost-effective recruitment and research platform" (p. 1). See Table 8 for a list of the inherent strengths and weaknesses of crowdsourcing.

Snowball sampling. Snowball sampling is a method whose operation is dependent on a relationship model. In the first stage, the requester forwards a response appeal to an initial list of persons (often referred to as *seeds*) together with a request that they redirect the appeal to other

Table 8

Strengths and Weaknesses of Crowdsourcing (Arch & Carr, 2016)

Strengths	Weaknesses
Faster rate of data collection	Risk of false information
Lower cost of data collection	Possible inequities in demographic metrics
Potentially wider/broader response samples	
Anonymity policy ensures responder privacy	
Requester may reject poor quality work	

qualified recipients. The process repeats at each subsequent stage and may extend through any number of stages (Chromy, 2008). The snowball sampling method is effective in reaching hidden and difficult-to-reach communities. In the context of this study, IT executives, especially those associated with smaller organizations, were difficult to locate hence snowball sampling was appropriate for reaching this population. Compared to traditional means, this technique often shortens the time and reduces the cost of reaching a participant group of sufficient size. However, by its nature, the snowball sampling method is a non-probability method and does not desire produce random samples. The introduction of bias into the process through the selection of the seeds is possible and there are no statistically acceptable means for determining a level of population saturation (Salganik & Heckathorn, 2004; Sadler, Lee, Lim, & Fullerton, 2010).

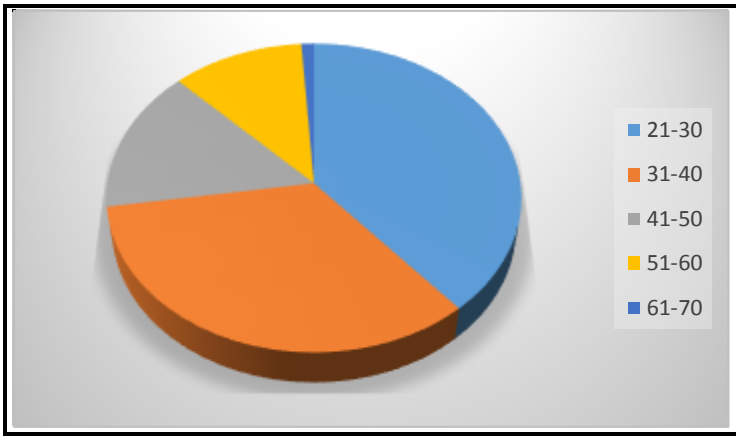
Mechanical Turk. Mechanical Turk is an online web service operated by Amazon designed to enlist groups of human participants for various purposes including intelligence gathering. Mechanical Turk acts as a marketplace, matching requesters and participants according to the job request description and participation requirements provided by the requester. Other firms such as SurveyMonkey offer similar recruiting services, but the filtering qualities and features of Mechanical Turk are superior to those offered by those providers. Advantages of the use of the Mechanical Turk service include access to a large, stable, and diverse participant pool, lower cost of data collection, and reduced lag time between survey design and data

collection. As verified by Buhrmester, Kwang, and Gosling (2011), the data obtained through Mechanical Turk was as reliable as data collected through traditional means. To provide additional confidence of having addressed selection bias as suggested by Peer, Vosgerau, and Acquisti (2014), the respondents were required to have demonstrated a 95% approval rating for their previous survey work. The survey used in this study also included questions to further screen the respondents beyond the required participation qualifications included in the Mechanical Turk job request description.

Survey instrument and data collection results. SurveyMonkey was the platform used for the survey. The branching logic and data analytics capabilities of this platform proved suitable for the study's purpose. The survey contained 74 questions including 16 demographic questions (see "Appendix A: Cloud Computing Adoption Survey Logical Flow"). The survey process produced 232 responses from qualified participants. Of that total, Mechanical Turk provided the source of 183 responses while the remaining 49 responses came from the LinkedIn connections to known IT executives. Although the responses would have been indistinguishable from others in the second group, the belief is few if any responses resulted from the use of the snowball sampling method. Respondents representing themselves as their company's or organization's top person responsible for their IT strategy and/or selection decisions or one who participates in strategic purchasing decisions regardless of title were deemed "qualified" for the survey. See "Dataset Modifications and Measurement Model."

Overall Response Demographics

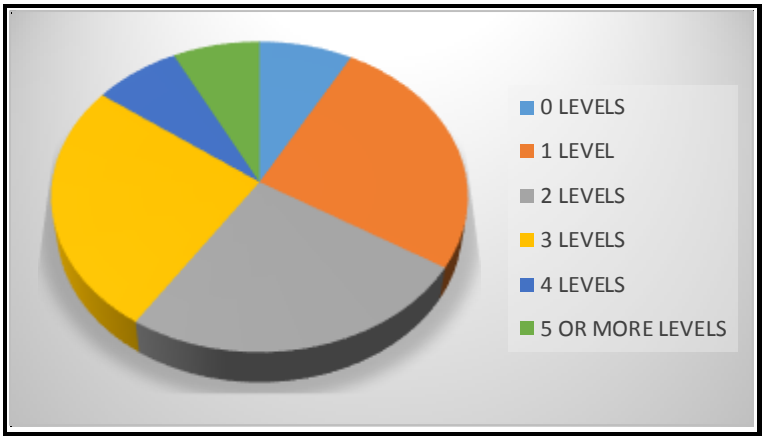
The mean age of the respondents was 35.6 years. In the respondent group, 72.6% were age 40 or less. See Figure 2.



AGE RANGE	COUNT	PERCENT
21-30	72	38.71%
31-40	63	33.87%
41-50	28	15.05%
51-60	21	11.29%
61-70	2	1.08%

Figure 2. Age breakdown of respondent group.

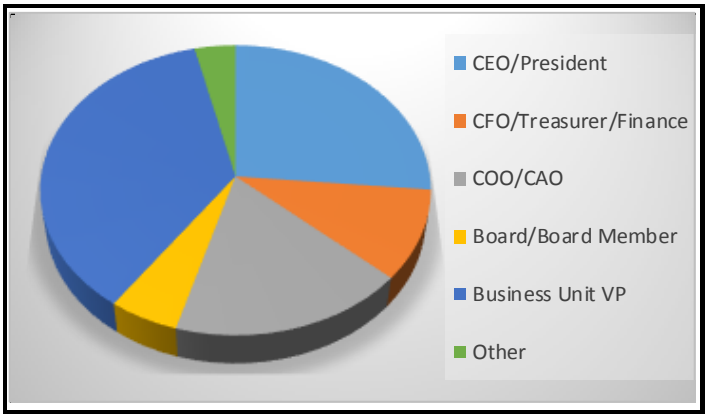
One hundred fifty-two respondents were male, representing 80.4% of the total group. Of the 189 useable responses, 148 (78.31%) were from the top person responsible for IT with titles such as CIO, Vice President of IT, IT Director, IT Manager, or a similar title. The remaining 41 (21.69%) respondents were not the top IT person, but identified themselves as participants in strategic purchasing decisions related to IT. Of the 189 respondents, 49 reported to the top executive in their company or organization. Another 48 respondents reported two levels from the top executive, 49 three levels, 14 four levels, and 14 reported five or more levels from the top executive. See Figure 3 for more details.



LEVELS	COUNT	PERCENT
0	15	7.94%
1	49	25.93%
2	48	25.40%
3	49	25.93%
4	14	7.41%
5 OR MORE	14	7.41%

Figure 3. Reporting levels separating respondents from top executive of their company or organization.

Of the 189 respondents, 50 (26.46%) reported to either the CEO or president of their company. Another 10 (5.29%) report to a member of their board of directors. Only 19 (10.05%) companies still followed the legacy association of IT reporting to Finance. See Figure 4 for a complete breakdown of the reporting associations contained in the dataset.



REPORTS TO	COUNT	PERCENT
CEO/President	50	26.46%
CFO/Treasurer/Finance	19	10.05%
COO/CAO	34	17.99%
Board/Board Member	10	5.29%
Business Unit VP	69	36.51%
Other	7	3.70%

Figure 4. Reporting associations between the respondents and their supervisors.

Of the 15 respondents who identified themselves as the top executive of their company, seven or 46.67% worked in the information technology and high tech industries. The dataset contained responses representing 18 specific industries. In addition, three respondents worked for other non-specific industries and four respondents chose not to reveal their industries. Less than three percent (2.12%) of the responses came non-profit organizations and governmental agencies. Among the for-profit enterprises, 81.03% of the respondents represented privately held companies while 18.97% represented publicly traded companies. See Table 9 for details concerning industry representations within the dataset.

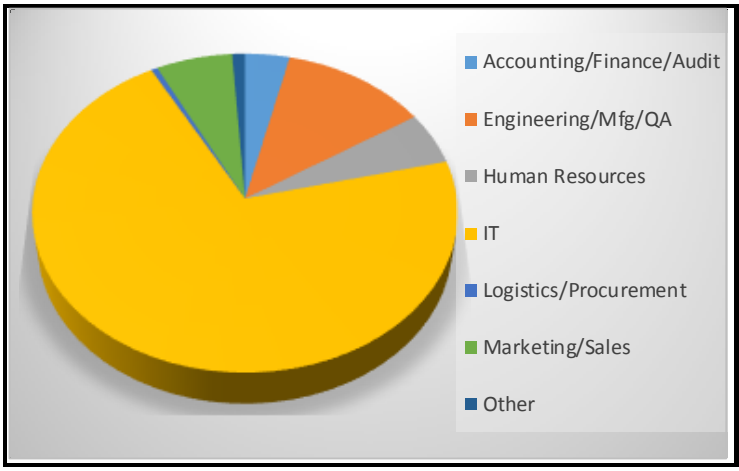
More than two-thirds of the respondents (70.90%) were located in the IT department (see Figure 5). However, 23 respondents worked in the engineering, manufacturing, or quality assurance areas of their companies. Perhaps as a reflection of the growing presence of many

companies on the Internet, 12 respondents (6.35%) were located in the marketing or sales functional areas of their companies.

Table 9

Industry Representation in Dataset

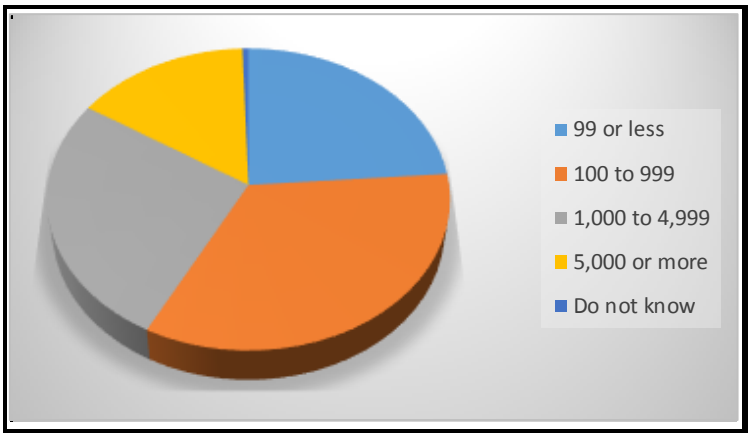
Industry	Count	Percent
Choose Not to Disclose	4	2.12%
Agriculture & Natural Resources	1	0.53%
Arts, Media, & Entertainment	2	1.06%
Building Trades & Construction	3	1.59%
Consulting & Contracting Services	10	5.29%
Education, Child Development, & Family Services	14	7.41%
Energy & Utilities	5	2.65%
Engineering & Design	20	10.58%
Fashion & Interior Design	3	1.59%
Financial Services	18	9.52%
Food & Beverage	1	0.53%
General Manufacturing & Product Development	7	3.70%
Health Science & Medical Technology	6	3.17%
Hospitality, Tourism, & Recreation	3	1.59%
Information Technology & High Tech	76	40.21%
Marketing, Sales, & Service	4	2.12%
Non-profit Organization	4	2.12%
Public & Government Services	2	1.06%
Transportation	3	1.59%
Other	3	1.59%



DEPARTMENT	COUNT	PERCENT
Accounting/Finance/Audit	7	3.70%
Engineering/Mfg/QA	23	12.17%
Human Resources	10	5.29%
IT	134	70.90%
Logistics/Procurement	1	0.53%
Marketing/Sales	12	6.35%
Other	2	1.06%

Figure 5. Organizational or functional departments represented by the respondents.

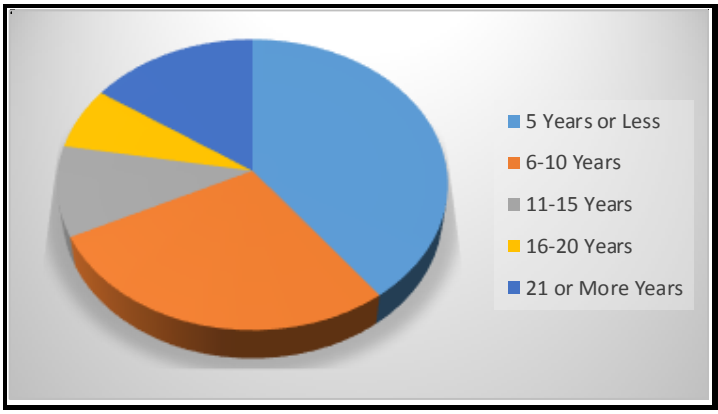
Seventy-nine (42.02%) of the respondents represented companies in the large and enterprise categories. Forty-five (23.94%) of the firms represented qualified as small companies. See Figure 6 for the breakdown.



WORKFORCE SIZE	COUNT	PERCENT
99 or less	45	23.94%
100 to 999	64	34.04%
1,000 to 4,999	50	26.60%
5,000 or more	29	15.43%
Do not know	1	0.53%

Figure 6. Company size as represented by respondents and described by workforce count.

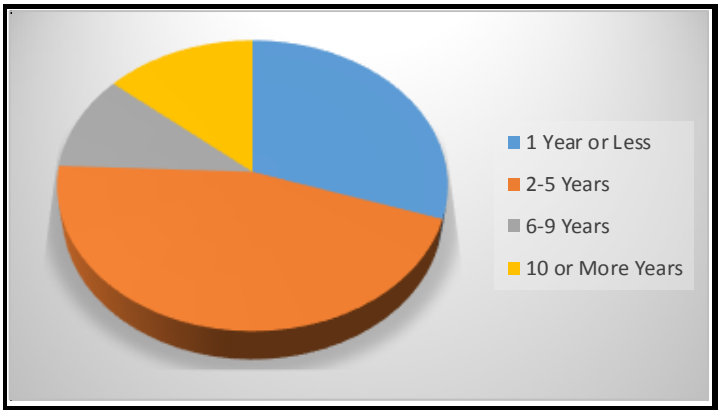
The number of total years of IT experience appeared to be consistent with the average age of the respondents. Seventy-five (39.68%) of the respondents had five or less years of related experience. The mean length of IT experience for the complete sample was 9.62 years. See Figure 7 for more details.



YEARS OF EXPERIENCE	COUNT	PERCENT
5 Years or Less	75	39.68%
6-10 Years	53	28.04%
11-15 Years	19	10.05%
16-20 Years	13	6.88%
21 or More Years	29	15.34%

Figure 7. Total years of IT experience represented by respondents.

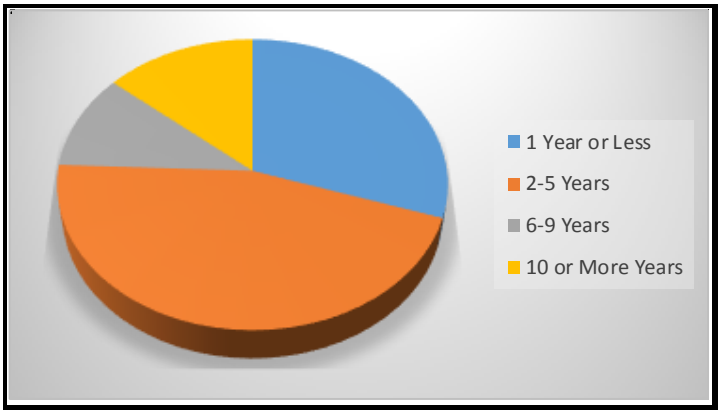
More notable is the length of time these IT executives had spent in the top IT position. The responses show 143 (75.66%) of the respondents had five or fewer years of experience as the top IT person. Only 26 (13.76%) of the respondents had more than 10 years of top IT executive experience. The mean length of top IT person experience for the complete sample was 4.75 years. See Figure 8 for the complete breakdown of responses.



YEARS OF EXPERIENCE	COUNT	PERCENT
1 Year or Less	57	30.16%
2-5 Years	86	45.50%
6-9 Years	20	10.58%
10 or More Years	26	13.76%

Figure 8. Total years of experience as top IT person.

Data analysis revealed 122 (64.55%) of the respondents had five years or less tenure time with their current companies (see Figure 9). Only 13.76% of the respondents had 10 or more years of employment with their companies. The average length of time with the associated firms for the complete sample was 5.69 years.



YEARS AT COMPANY	COUNT	PERCENT
1 Year or Less	20	10.58%
2-5 Years	102	53.97%
6-9 Years	41	21.69%
10 or More Years	26	13.76%

Figure 9. Total years of employment at current company.

Sample Bias

By definition, when using snowball sampling, the initial seed sample is a random selection from a finite group (Goodman, 1961). However, in the current study, as with most studies of this type, a convenience sample yielded the initial sample (e.g., Magnani, Sabin, Saidel, and Heckathorn, 2005; Sadler, Lee, Lim, and Fullerton, 2010; Warkentin, Johnston, and Shropshire, 2011). This means that there was a danger of selection bias based on the initial seed sample. In other words, the sample may contain an over-representation of individuals who share many of the characteristics of the seed (Magnani et al., 2005; Sadler et al., 2010). However, Table 10 provides a comparison of the industry distribution of the seed and the sample. From the comparison, it is clear that given the use of snowball sampling in conjunction with crowdsourcing, the impact of sample bias was minimal.

Dataset Modifications and Measurement Model

Fornell and Larcher (1981) suggested the existence of three properties of interest for each unobservable variable: (a) internal consistency reliability, (b) discriminant validity, and (c) average variance explained. Cronbach's alpha has become the standard for determining the level of a model's internal consistency reliability (Henseler, Ringle, & Sinkovics, 2009). These widely

accepted measures and standards directed the data analysis for the current study. Analysis of the raw data collected from the responses to the survey revealed 20 incomplete responses that

Table 10

Industry Comparison of LinkedIn Subset to Full Sample

Industry	LinkedIn Subset	Full Sample
Agriculture & Natural Resources	0.46%	2.12%
Arts, Media, & Entertainment	0.00%	0.53%
Building Trades & Construction	0.46%	1.06%
Consulting & Contracting Services	13.39%	1.59%
Education, Child Development, & Family Services	9.72%	5.29%
Energy & Utilities	4.17%	7.41%
Engineering & Design	0.46%	2.65%
Fashion & Interior Design	0.00%	10.58%
Financial Services	18.52%	1.59%
Food & Beverage	3.7%	9.52%
General Manufacturing & Product Development	6.02%	0.53%
Health Science & Medical Technology	16.20%	3.70%
Hospitality, Tourism, & Recreation	0.93%	3.17%
Information Technology & High Tech	8.80%	1.59%
Marketing, Sales, & Service	4.63%	40.21%
Non-profit Organization	0.46%	2.12%
Public & Government Services	7.41%	2.12%
Transportation	7.41%	1.06%
Other	1.38%	1.59%

affected Cronbach alpha values negatively. Consequently, it was necessary to remove these rows from the analysis.

The dataset was processed through the PLS Algorithm, a function of SmartPLS. SmartPLS, developed by Ringle, Wende, and Will (2005) is an effective tool in testing theoretically supported causal models such as the one included in the current study (Kwong & Wong, 2013). Figure 10 depicts the model of constructs with the loadings developed by SmartPLS.

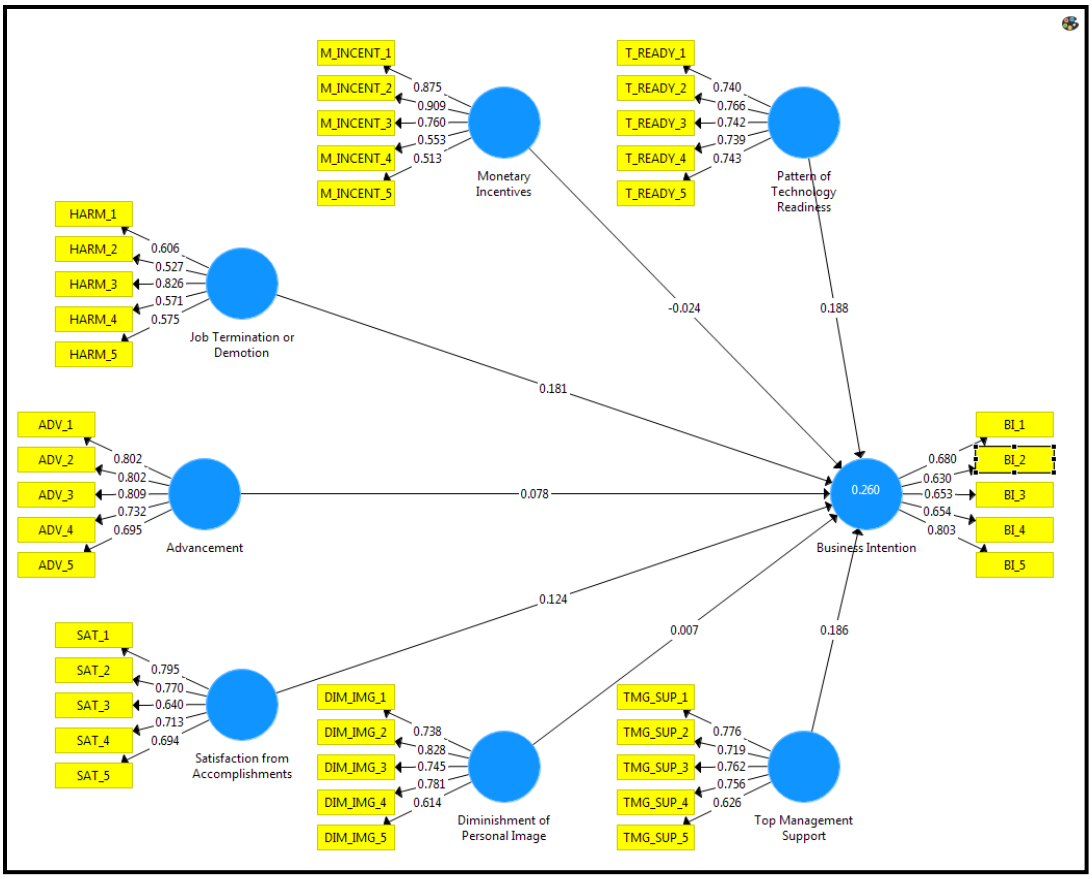


Figure 10. Original model including all indicators.

Several of the indicators (M_INCENT_4, M_INCENT5, DIM_IMG_5, HARM_2, HARM_4, HARM_5, BI_1, and BI_2) did not load properly, resulting in their elimination from the model. The PLS Algorithm was rerun with the indicators in question removed from the model. Figure 11 shows the result of the rerun.

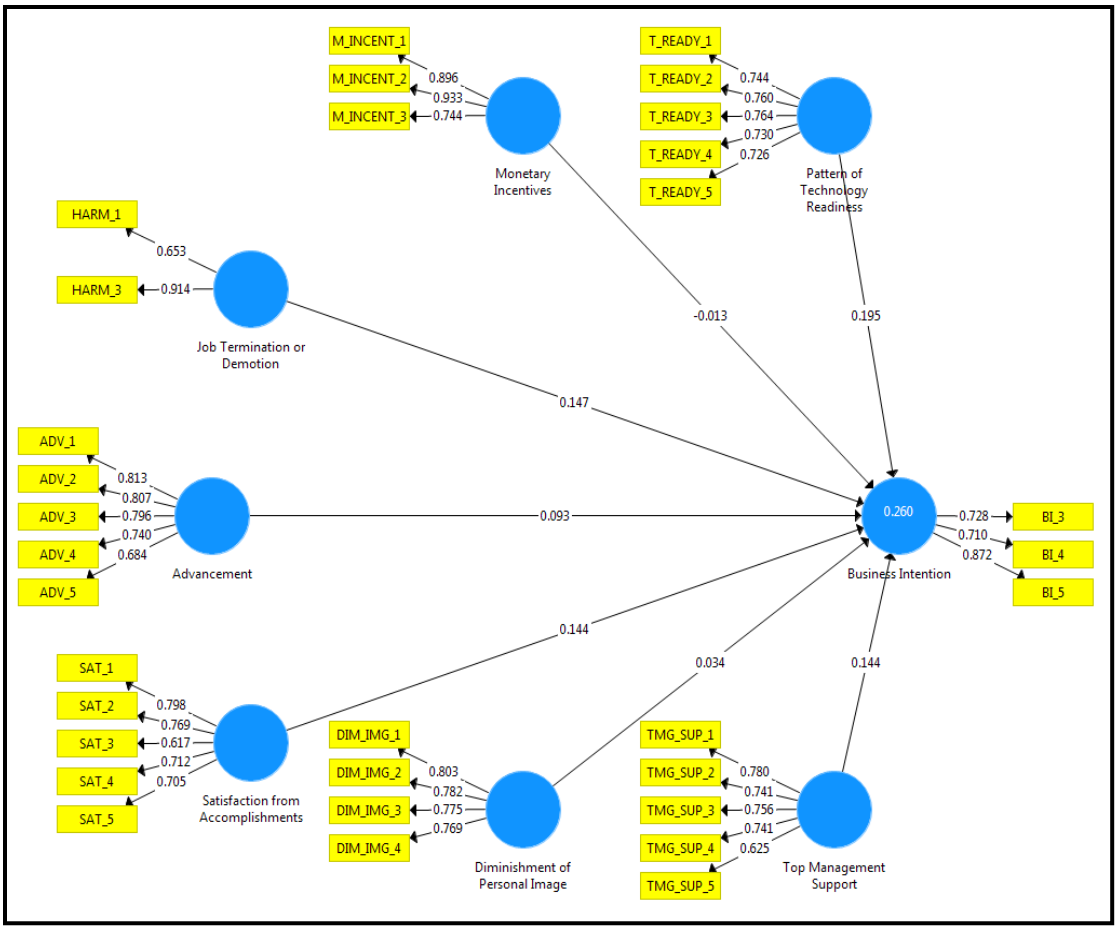


Figure 11. Revised model after removal of insignificant indicators.

Overall, the R^2 remained the same (.260). The means for the three constructs impacted by the model change increased. See Table 11 for a comparison between the means of the original and revised models.

Table 11

Comparison of Construct Means of Original and Revised Models

Construct	Original Model Mean	Revised Model Mean
Monetary Incentives	.722	.858
Job Termination or Demotion	.621	.784
Diminishment of Personal Image	.741	.782

Internal consistency reliability reflects the coherence of construct indicators (i.e., factors) (McCrae, Kurtz, Yamagata, & Terracciano, 2011). According to Henseler et al. (2009), a

Cronbach alpha value of .7 was an indication of internal consistency reliability. The lowest Cronbach alpha value for the construct indicators in the dataset was .704 with the exception of job termination or demotion (.449). Suspecting the existence of multicollinearity with another construct, a check of SmartPLS' Discriminant Validity Report confirmed job termination or demotion and diminishment of personal image are highly correlated (see Figure 12).

	Advancement	Business Intention	Diminishment of Personal Image	Job Termination or Demotion	Monetary Incentives	Pattern of Technology Readiness	Recognition and Satisfaction from Accomplishments	Top Management Support
Advancement	.770							
Business Intention	.312	.773						
Diminishment of Personal Image	.188	.266	.782					
Job Termination or Demotion	.197	.225	.526	.794				
Monetary Incentives	.486	.196	.070	.147	.862			
Pattern of Technology Readiness	.387	.409	.220	.045	.355	.745		
Recognition and Satisfaction from Accomplishments	.445	.400	.450	.249	.266	.507	.723	
Top Management Support	.349	.374	.205	-.012	.216	.656	.459	.731

Figure 12. Construct correlations with job termination or demotion construct included.

Consequently SmartPLS' PLS Algorithm function was rerun without the job termination or demotion construct. Figure 13 shows the results.

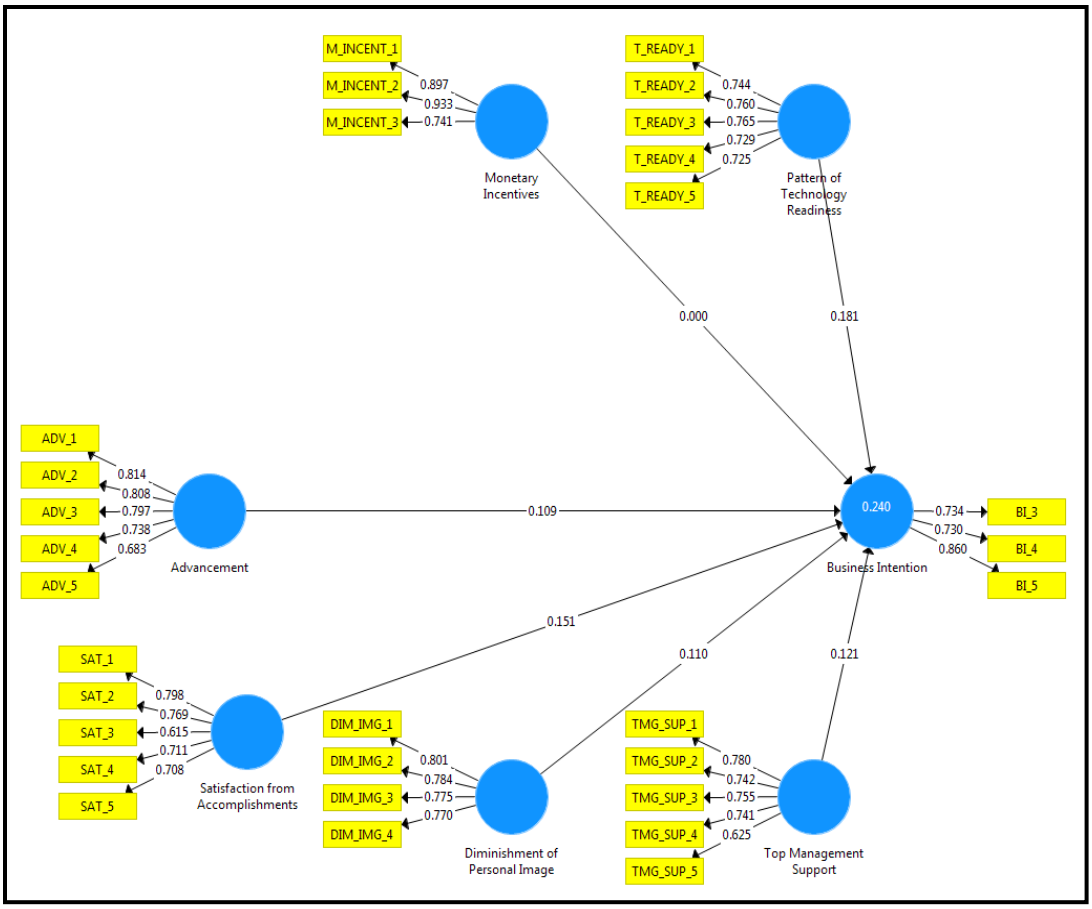


Figure 13. Revised model after removal of job termination or demotion construct.

The R^2 value for the model experienced a reduction from .26 to .24. Since the square root of AVE (shown on the diagonal of the construct correlations in Table 12) for each latent variable was greater than the correlation of that variable with other latent variables, the Fornell and Larcker criterion was satisfied (Fornell & Larcker, 1981). This condition represented good discriminant validity (Henseler et al., 2009). Good discriminate validity is an indication that the test of one construct is not highly correlated with tests of other constructs (Campbell & Fiske, 1959). In addition, all values for the square root of AVE were greater than .67, which indicated good convergent validity (Henseler et al., 2009).

This model produced Cronbach values no less than .704. A Cronbach value of at least .7 for a particular construct is an indication of good discriminant validity (Hair et al., 2009). See

Figure 14. Also in Henseler et al. (2009), average variance explained (AVE) serves as a "criterion of convergent validity" (p. 299). They suggested a threshold value of .5 was a necessary indication of sufficient convergent validity. According to Henseler et al. (2009), an AVE value of at least .5 signified "a latent variable is able to explain more than half of the variance of its indicators on average" (p. 299). A processing of the dataset produced AVE values for all of the constructs in excess of the .5 threshold (see Figure 14 for AVE values).

Scale Item	Standard Loading	Cronbach's Alpha	AVE	Composite Reliability
ADV_1	.814	.827	.592	.878
ADV_2	.808			
ADV_3	.797			
ADV_4	.738			
ADV_5	.683			
BI_3	.734	.704	.603	.819
BI_4	.730			
BI_5	.860			
DIM_IMG_1	.801	.794	.612	.863
DIM_IMG_2	.784			
DIM_IMG_3	.775			
DIM_IMG_4	.770			
M_INCENT_1	.897	.831	.742	.895
M_INCENT_2	.933			
M_INCENT_3	.741			
T_READY_1	.744	.801	.555	.862
T_READY_2	.760			
T_READY_3	.765			
T_READY_4	.729			
T_READY_5	.725			
SAT_1	.798	.776	.522	.844
SAT_2	.769			
SAT_3	.615			
SAT_4	.711			
SAT_5	.708			
TMG_SUP_1	.780	.785	.534	.851
TMG_SUP_2	.742			
TMG_SUP_3	.755			
TMG_SUP_4	.741			
TMG_SUP_5	.625			

Figure 14. Factor analysis.

Common method variance (CMV), according to Podsakoff, MacKenzie, Lee, and Podsakoff (2003), is that which is attributable to the measurement method itself rather than factors related to model constructs. They further suggested, as a remedy to common method bias, Harman's (1976) single-factor test was appropriate. That test holds that if no construct in a given

model explains a majority of the variance, common method bias does not exist. In the case of this model, the seven factors accounted for 61.4% of the total variance explained and none of the factors exceeded 13.8%. Consequently, no single factor represented a majority of the total variance. This was an indication that common method bias was not an issue in the dataset.

Structural Model

Each unobservable variable received positive confirmation for the three properties of interest (i.e., internal consistency reliability, discriminant validity, and average variance explained). Figure 15 describes the R^2 value (.24) and the path coefficients of the inner-path model. One of the seven hypotheses (pattern of technology readiness) was significant with a $p <$ .001 and had a path coefficient of .181.

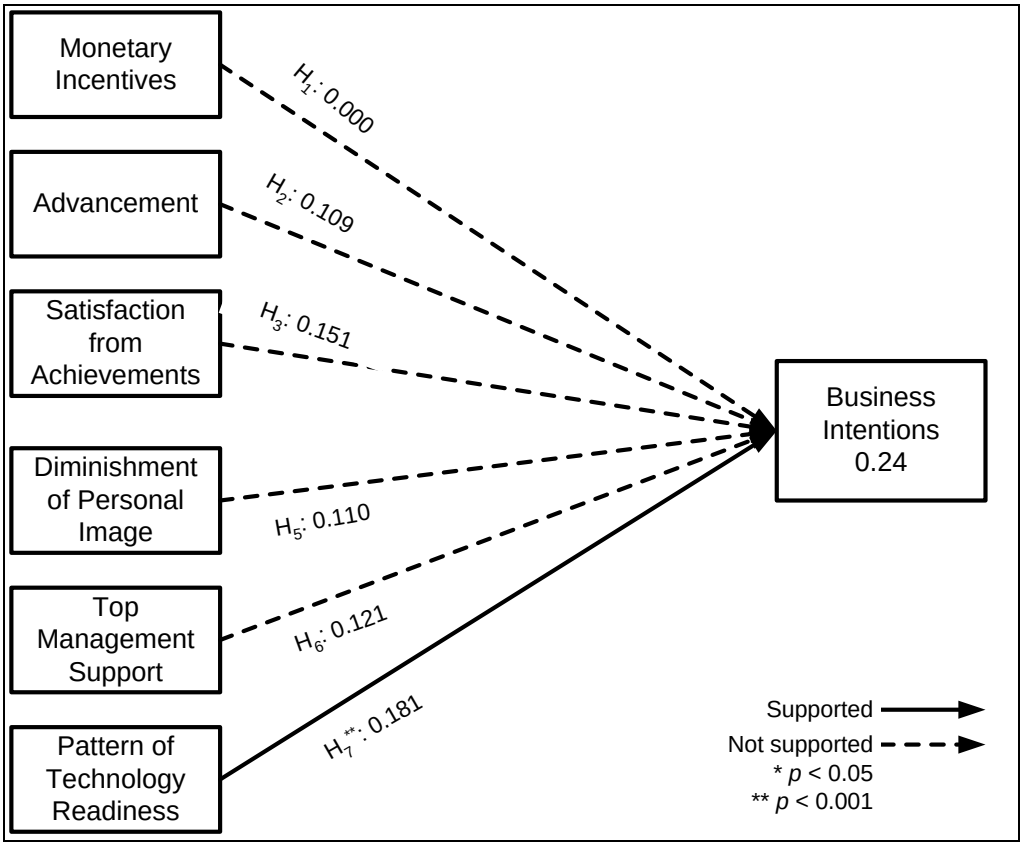


Figure 15. Structural model showing path coefficients.

Hypothesis Summary

Data analysis provided support for one of the hypotheses—pattern of technology readiness. See Figure 16 for a complete summary of outcomes.

Hypothesis			Path Coefficient	*p*-value
H_1	Monetary incentives have a positive influence on business intentions to adopt cloud computing services.	Not supported		.996
H_2	Advancement opportunities have a positive influence on business intentions to adopt cloud computing services.	Not supported		.202
H_3	Recognition and satisfaction from accomplishments has a positive influence on business intentions to adopt cloud computing services.	Not supported		.064
H_4	Job termination or demotion has a negative influence on business intentions to adopt cloud computing services.	Not supported	N/A	N/A
H_5	Diminishment of personal image has a negative influence on business intentions to adopt cloud computing services.	Not supported		.083
H_6	Top management support has a positive influence on business intentions to adopt cloud computing services.	Not supported		.178
H_7	Pattern of technology readiness has a positive influence on business intentions to adopt cloud computing services.	Supported	.181	.025 (< .05)

Figure 16. Hypothesis summary.

Mediating Conditions

The initial data analysis found that the monetary incentives, advancement, and recognition and satisfaction from accomplishments, diminishment of personal image, and top management support constructs were not significant. This outcome appeared incongruent with other research. For instance, Friedlander (1963) produced research on the connection between satisfaction from accomplishments, recognition from management for accomplishments, positive personal image, monetary rewards, and advancement. He summarized these items into three factors he referred to as “social and technical environment,” “intrinsic self-actualizing work aspects,” and “recognition through advancement” (p. 248), concluding that these factors were indicators of overall job satisfaction. Suddarth (1988) concurred with relationship. He submitted personal incentives included perceived job opportunities, environmental culture, and job satisfaction. In other specific research, Gagne and Deci (2005) stressed the importance of

monetary incentives as an important extrinsic motivator. Masson (1971) submitted that both monetary incentives (including raises resulting from a promotion) and satisfaction received from completing a challenge were key job characteristics. The studies suggested the five constructs in question should have produced significant outcomes and further suggested an associative connection exists between the constructs. Consequently, the totality of these studies suggested the possible existence of mediating conditions between these three constructs.

To test for mediation, satisfaction from accomplishments became a mediating variable in the model (see Figure 17).

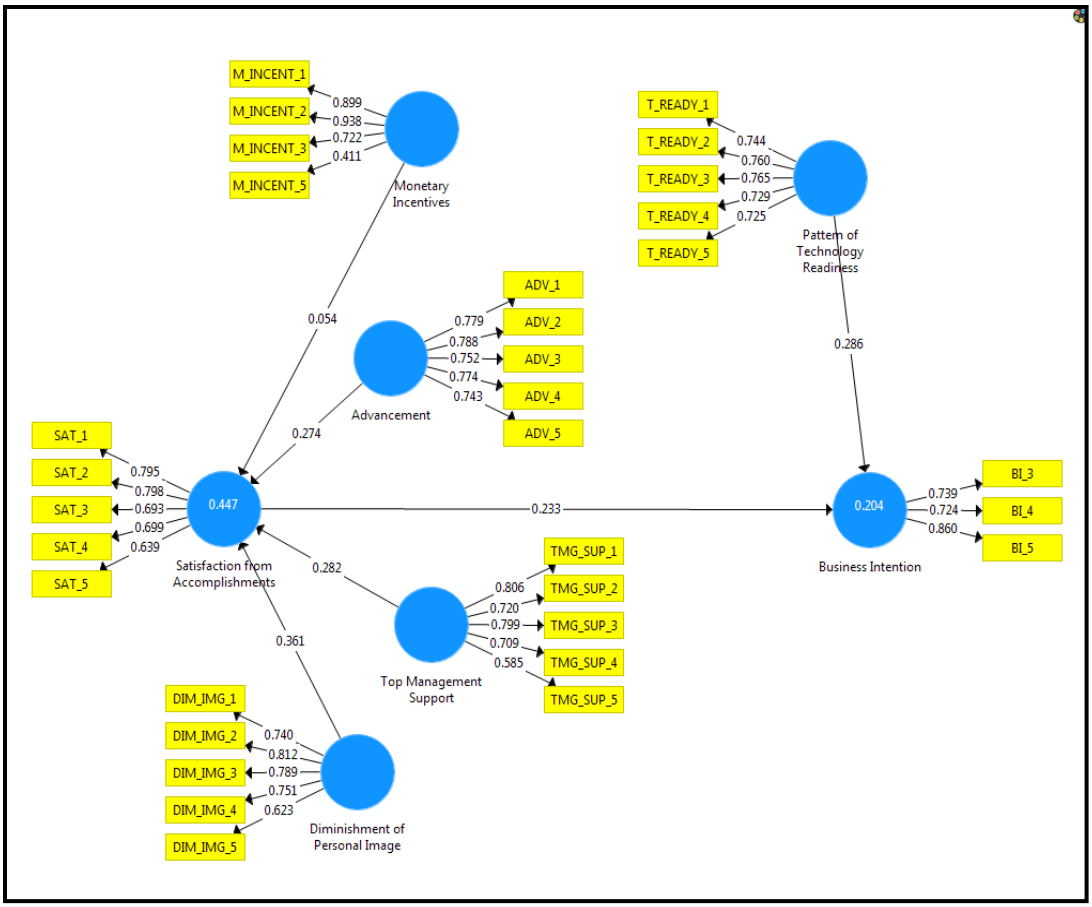


Figure 17. Satisfaction from accomplishments used in the structural model as a mediator.

The PLS algorithm and bootstrapping functions in SmartPLS were rerun subsequently. The results produced a reduction in the R^2 value (.240 to .204), but provided support for five hypotheses. Figures 18 and 19 demonstrate the impact of the mediation.

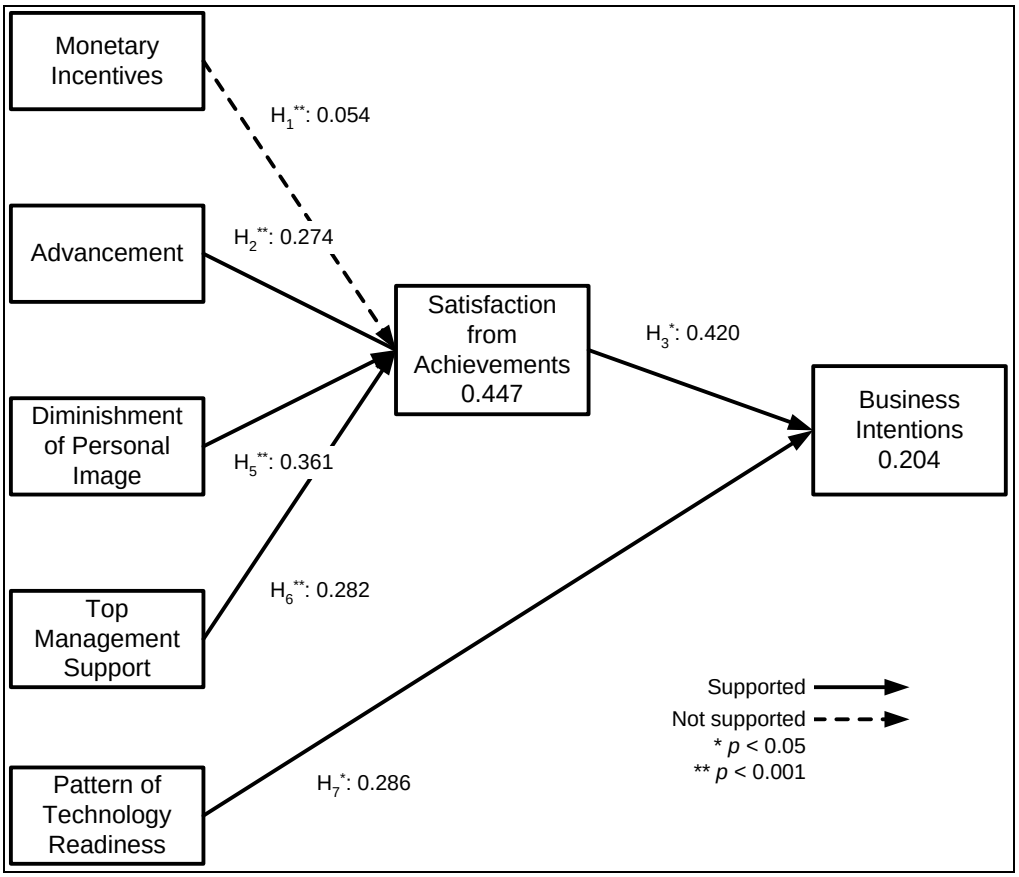


Figure 18. Alternative structural model.

Without Mediation	Path Coefficient	T Statistic	*p*-value
Monetary Incentives ➔ Business Intentions	.000	0.071	.996
Advancement ➔ Business Intentions	.109	1.275	.202
Satisfaction from Accomplishments ➔ Business Intentions	.151	1.856	.064
Diminishment of Personal Image ➔ Business Intentions	.110	1.735	.083
Top Management Support ➔ Business Intentions	.121	1.348	.178
With Mediation			
Monetary Incentives ➔ Satisfaction from Accomplishments	.520	0.967	.334
Advancement ➔ Satisfaction from Accomplishments	.328	3.536	.000
Satisfaction from Accomplishments ➔ Business Intentions	.420	3.189	.001
Diminishment of Personal Image ➔ Satisfaction from Accomplishments	.361	5.629	.000
Top Management Support ➔ Satisfaction from Accomplishments	.282	4.055	.000

Figure 19. Impact of mediation.

The monetary incentives construct was not supported under the alternative model, but three constructs in question found support at the $p < .001$ level. Two other constructs (satisfaction

from accomplishments and pattern of technology readiness) received support at the $p < .05$ level. See Figure 20 for the alternative hypothesis summary.

Hypothesis			Path Coefficient	*p*-value
H_1	Monetary incentives have a positive influence on cloud computing adoption levels.	Not supported		.334
H_2	Advancement opportunities have a positive influence on cloud computing adoption levels.	Supported	.328	.000 (< .001)
H_3	Recognition and satisfaction from accomplishments have a positive influence on cloud computing adoption levels.	Supported	.420	.001 (< .05)
H_4	Job termination or demotion has a negative influence on cloud computing adoption levels.	Not supported	N/A	N/A
H_5	Diminishment of personal image has a negative influence on cloud computing adoption levels.	Supported	.361	.000 (< .001)
H_6	Top management support has a positive influence on cloud computing adoption levels.	Supported	.282	.000 (< .001)
H_7	Pattern of technology readiness has a positive influence on cloud computing adoption levels.	Supported	.181	.025 (< .05)

Figure 20. Alternative hypothesis summary.

Chapter 5: Discussion and Limitations

The primary purpose of this study was to identify the personal factors considered by IT executives when making a decision to adopt or not adopt cloud computing services. The study sought to answer two questions:

- Which personal decision-making factors have the greatest influence on business intentions and consequent cloud computing adoption levels?
- Do the personal desires of the IT executive for recognition by superiors and peers impact decision-making considerations?

The study considered two structural models. The first model linked all seven constructs directly to the dependent variable (TOTAL_BI). This structure produced support for one hypothesis (see Table 14). However, previous studies including Gagne and Deci (2005) and Masson (1971) suggested the monetary incentives, advancement, and recognition and satisfaction from accomplishments constructs should produce significant outcomes and further submitted an associative connection existed between the constructs. The works of Suddarth (1988) and Friedlander (1963) supplied a similar conclusion, opining that a relationship was present between the constructs. Consequently, it seemed likely that a mediating condition was present. An alternate model that included the recognition and satisfaction from accomplishments mediator provided support for five of the hypotheses. The five supported hypotheses were:

- Advancement opportunities have a positive influence on business intentions to adopt cloud computing services,
- Recognition and satisfaction from accomplishments have a positive influence on business intentions to adopt cloud computing services,

- Top management support has a positive influence on business intentions to adopt cloud computing services,
- Diminishment of personal image has a negative influence on business intentions to adopt cloud computing services., and
- Pattern of technology readiness has a positive influence on business intentions to adopt cloud computing services.

All five of the supported hypotheses appear to have a common characteristic: perceived personal risk is the trade-off in each case. As the degree of perceived personal risk increases, the level of perceived benefit must also increase to avoid influencing the decision-making balance.

Advancement Opportunities

Construct analysis. Agency theory suggested an explanation for the outcomes of the advancement opportunities hypothesis. In the classic "for this, you get that" arrangement, the agent would choose to take such actions as to maximize their chances in being successful in attaining the reward associated with the contract. Theory of Reasoned Action (TRA) (Ajzen, 2005) also appeared to be congruent with the outcomes associated with these constructs. The notion that "human beings usually behave in a sensible manner" (p. 117), provided additional evidence of the desire of agents to take actions, including the decisions they make, that would afford the greatest opportunity for success.

Ajzen (2012) also suggested a source of predicted behavior was the conditioned reflex. His research suggested an explanation behind the hesitancy of executives who choose to refrain from taking higher future risk actions if previous decisions have resulted in negative consequences. Young et al. (2012) stated in relationship to financial incentives in a pay-for-performance situation, the agent is "assumed to be risk averse" (p. 965). Dewett (2007) cited the

previous work of Deci and Ryan when he concluded intrinsic motivation, "mediates the relationship between certain antecedents and one's willingness to take risks" (p. 197). These results suggested financial betterment represented a strong, direct source of motivation.

Implications of findings. For an advancement incentive to be effective, the agent must conclude that the risk is reasonable or mitigatable where ultimate success is likely. Sales organizations within cloud computing service providers should emphasize solutions for the factors identified by Bendovschi et al. (2014), namely data custody and fear factors such as integration and confidentiality. This would require engendering vendor trust with qualities such as longevity of relationship and data propriety. Other strategies could include initially proposing lower risk services targeting non mission-critical applications such as platform as a service for disaster recovery.

Recognition and Satisfaction from Accomplishments

Construct analysis. Dewett (2007) also determined a relationship existed between intrinsic motivation and encouragement and creativity, self-efficacy, and risk taking. It is the belief in one's ability to achieve goals and the actual realization of those goals that creates the desire and motivation to experience more of the same. Cabanac (1992) suggested sensory pleasure provided a common *motivational currency*. Cabanac (1992) further believed there was an unambiguous relationship between this sense of personal joy and one's sense of usefulness. This linkage may explain the connection expressed by the respondents between the personal importance of accomplishments and the level of cloud adoption in that person's organization. Dewett (2007) found that incentives may also come in negative forms such as fear. He determined a relationship existed between intrinsic motivation and encouragement and creativity,

self-efficacy, and risk taking. This finding suggests an agent seeking satisfaction and recognition will take risks only to the extent that a path to success was viable.

Implications of findings. The implications of these findings suggest that sales organizations of cloud computing vendors should demonstrate clearly how a successful outcome is realizable. This assurance could come in several forms. Whether it is demonstrating how other companies have been successful with similar initiatives, offering critical resources to assist in the process, showing a pattern of success, or using a pilot program strategy, these approaches all have the same objective: cause the IT executive to believe that the likelihood of an experience that produces a feeling of personal satisfaction is reasonable.

Pattern of Technology Readiness

Construct analysis. The support for this hypothesis was not surprising. A pattern of technology readiness and an associated experienced staff serve as major mitigants to the inherent risk of any new technology implementation. Espadanal's (2012) study of 249 IT executives found support for the hypothesis that "technology readiness will positively influence cloud computing adoption" (p. 17) at the $p < .01$ level. Ifinedo (2011) spoke to the importance of having human knowledge and experience on the organization's staff as important factors for adoption decisions. These studies suggested that IT executives believed technology readiness, including the availability of experienced staff members, provided risk mitigation in projects such as those required to migrate major applications to the cloud.

Implications of findings. Once again, research indicated a link between the perceived risk associated with a construct and adoption levels. Consequently, the sales organizations should emphasize their strategies for offsetting these risks. These strategies may include provisions for supplying the project with an experienced project manager from their staff to augment the IS

staff of the organization, use of widely-accepted project management methodologies that embody key principles such as user sign-offs and system acceptance procedures, timely issue resolution measures, thorough system and performance testing, and systematic status reporting.

Top Management Support

Construct analysis. Consistent with Low et al. (2011), Espadanal and Oliveira (2012), and Tashkandi and Al-Jabri (2015), this hypothesis found support in this study as well. Risk has a role with this construct. As confirmed in Espadanal and Oliveira (2012), a company management's willingness to take risks, both financial and organizational, had an impact on the adoption of cloud computing. A trusting relationship had a direct bearing on the degree of top management support the IT executive can expect to receive for new IT initiatives (Espadanal & Oliveira, 2012). Trust and confidence were major factors in joint risk management for relational partnerships (Doloi, 2009).

Implications of findings. It is essential for the sales organizations of cloud service providers to take essential measures to enlist the continuous involvement of members of their client's top management team to ensure their support for these initiatives. Roure (2001) highlighted the importance a project champion from the ranks of senior management to serve as a project advocate and resource marshal. A sales organization can support their IT executive sponsor by assigning the internal champion a key position in the migration project.

Job Termination or Demotion

Construct analysis. The fear of job termination or demotion construct did not find support in this study. Other researchers such as Pasik (2013) and Howell (2015) believe this fear is overrated and unwarranted. In the current study, multicollinearity with another construct (diminishment of personal image) caused the removal of the job termination or demotion

construct. This outcome suggested that more research is in order to determine the factors that resulted in the highly correlated condition between these constructs.

Implications of findings. While the current study did not support this hypothesis, cloud computing service providers' sales organizations nonetheless should still assume skepticism on the part of IT executives who may realize the possible consequences of their migration decisions. In their recent white paper, "Four reasons why CIOs lose their jobs" (2015), Silverton Consulting stated that security breaches, large project failures, system availability problems, and system outages are the four leading causes of IT executive dismissal. While security breaches, large project failures, and system availability problems are more likely to occur than system outages in the cloud environment, all four of the event types are possible. As Rogers (1975) revealed, the fear appeal is associated with the personal consequences of an event, the event's likelihood of occurring, and the person's means for preventing the event. Consequently, proposals submitted by these sales organizations should consider these factors and include the means for reducing the associated risks with migration projects and ongoing cloud operations.

Diminishment of Personal Image

Construct analysis. Although the current study's data produced support for the diminishment of personal image hypothesis, it suggested a positive rather than negative influence on business intentions. This finding implies a sacrificial tendency of IT executives to risk damage to their personal image for the betterment of the business. This finding is inconsistent with other research. For instance, Beach (1998) found a connection between image, decision-making, and choice sets. Mourmant, Gallivan, and Kalika (2009) spoke to the seriousness of image violations and their ultimate impact on an incumbent's decision to leave a particular

position. This finding in the current study warrants additional research to gain an understanding of its implications.

Monetary Incentives

Construct analysis. Researchers Gagne and Deci (2005), Masson (1971), and Friedlander (1963) submitted that along advancement opportunities, monetary incentives were key motivators. While Locke (2004) agreed with the importance of monetary incentives, he emphasized the qualities that were necessary for the incentive to be effective, specifically the reasonableness of the goal attached to the incentive. However, Vroom (1964), Jiambalvo (1979), and Ferris (1977) all reached contrarian conclusions—conclusions that align with the precepts of agency theory. Nevertheless, Ferris' (1977) observations may provide an explanation for the dichotomy. Ferris contended expectancy theory links the level of effort an individual was willing to commit to a difficult task to the size of the bonus. Consequently, a bonus may not induce the individual to take on a challenge if the reward represents only an incremental improvement to the executive's financial condition or the rubric of the determining the final evaluation was not clear.

Implications of findings. The current study and the results of other studies do not present a clear picture as to the effectiveness of monetary incentives. Cloud computing service providers' sales organizations, nevertheless, should not assume the IT executive is unaffected by the promise of financial condition improvements either in the form of monetary incentives (hypothesis not supported) or advancement (hypothesis supported). Rather, the sales teams should focus on describing how they may contribute to the success of the initiative, recognizing that a range of decision factors influence the IT executive and that these factors may include personal financial enrichment.

Conclusions

Study limitations. Ordinarily study limitations would include the use of the snowball sampling method. However, in the case of this study, I believe this method produced few, if any, participant responses. I should have realized that the constraints on executive time that guided the development of the instrument itself would also suggest an unwillingness of executives to take additional time to forward the survey announcement to their colleagues. Future researchers may choose to consider using other methods, such as periodic reminders, to boost the number of responses from this particular subject group.

Future research. The personal aspect of the cloud computing adoption decision is worthy of further research. Additional investigation into the correlations between the various fears and concerns identified in this study and demographic factors (e.g., age and gender of the executive, company industry and size, and reporting level within the organization) may produce greater insight about how perceived risks and benefits contribute to the cloud adoption decision-making process. An extension of this study to countries outside of the United States is also worthy of future research. Cultural differences present in countries outside of the United States may produce results that either support or challenge this study's results. Research that provides the means for estimating a tipping point between projected savings/benefits and perceived risks would be extremely useful to those same sales organizations. This study could leverage additional research into adoption for non-cloud computing technologies. Low et al.'s (2011) finding of a negative correlation of relative advantage to cloud computing adoption was highly interesting inasmuch as other studies such as Al-Shohaib et al. (2010), Khatiwada & Pigg (2010), and Al-Zoubi (2013) found a contradictory positive correlation. The results of previous studies may have influenced Low et al. (2011) to posit that a positive correlation existed in their original hypothesis. Although they suggested the number of non-responses incurred in their survey

process might have biased the outcomes of their study, this disparity warrants further research. Finally, the current study's finding of a positive correlation of diminishment of image and business intentions warrants further research due to its implications on business decisions.

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Appendices

Appendix A
Cloud Computing Adoption Survey Logical Flow

Motivations of Information Technology Executives and Their Impacts on Current Adoption Rates of Cloud Computing Services

Consent to Participate in a Research Study
University of the Incarnate Word

Consent to Participate

You are being asked to take part in a research study regarding the degree to which the decision to purchase of cloud services (types and number of applications) is affected by various factors. The survey will be available until August 8, 2016 and should take no more than ten (10) minutes to complete. The results of this study will benefit IT executives to design their own strategies based on what other companies have achieved successfully.

Participation in the survey is voluntary. If you decide to take part in the survey, please respond "yes" to the opt-in question at the bottom of the page. This will take you to the survey questions. If you do not wish to take part in the study, choosing "no" will exit you from the survey.

The survey will not request any identifying information. Stored responses will not include e-mail addresses. The study data analysis following the survey will use summarized information. All information will receive confidential treatment including in the event of the publication of study results. Any study data reported will appear in aggregate form.

If you have questions or you wish to report a problem related to this survey or study, please contact Dr. Vess L. Johnson at vljohnso@uiwtx.edu.

The University of the Incarnate Word committee that reviews research, the Institutional Review Board, approved this research in cloud technology on March 9, 2016. The UIWIRB is available to answer any questions about your rights as a research subject (210-829-2759—Dean of Graduate Studies and Research).

Thank you in advance for your participation.

Vess L. Johnson, Ph.D.

Marcus L. Smith, Jr., Candidate, Doctor of Business Administration Program

H-E-B School of Business & Administration

University of the Incarnate Word, San Antonio, Texas

Q1a Would you like to continue to the questionnaire?

❍ YES - I would like to continue (1)	Continue
❍ NO - I do NOT wish to participate (2)	Go to Q76

Q1b Are you 21 years of age or older?

❍ YES (1)	Continue
❍ NO (2)	Go to Q76

Figure 21. Informed consent introduction.

Q2 Are you currently or within the past six months been an IT employee (not a contractor or consultant), either in the IT department/function of your company/organization or an IT employee in another part of the company/organization?

- ❍ YES (1) — Continue
- ❍ NO (2) — Go to Q76

I1 ***If you left a prior position within the past six months, please complete the survey from the perspective of that position.***

Q3 Are you the top person responsible for IT strategy/selection decisions (e.g., the CIO, VP of IT, IT Director, IT Manager, etc.) for your company/organization?

- ❍ YES (1) — Continue
- ❍ NO (2) — Go to Q76

Q4 How long have you worked in the IT area?

- ❍ 5 years or less (1)
- ❍ 6-10 years (2)
- ❍ 11-15 years (3)
- ❍ 16-20 years (4)
- ❍ 21 or more years (5)

Q5 How long have you been the top person responsible for IT strategy/selection decisions?

- ❍ 1 year or less (1)
- ❍ 2-5 years (2)
- ❍ 6-9 years (3)
- ❍ 10 or more years (4)

Q6 In what department/functional area do you work?

- ❍ Accounting/Finance/Audit (1)
- ❍ Engineering/Manufacturing/Quality Assurance (2)
- ❍ Human Resources (3)
- ❍ IT (4)
- ❍ Logistics/Procurement/Supply Chain (5)
- ❍ Marketing/Business Development/Sales (6)
- ❍ Other (specify): (7) _____

Q7 The company/organizational context for my answers for the rest of this study will be with respect to (select only one):

- ❍ The entire company/organization (1)
- ❍ Corporate/organization headquarters (2)
- ❍ A business unit/function/department (3)

I2 ***For the remainder of the study "Company/organization" will refer to the context selected above.***

Q8 What is the size of your company/organization in terms of total employees?

- ❍ 99 or less (1)
- ❍ 100 to 999 (2)
- ❍ 1,000 to 4,999 (3)
- ❍ 5,000 or more (4)
- ❍ Do not know (5)

Q9 How long have you been employed by your company/organization?

- ❍ 1 year or less (1)
- ❍ 2-5 years (2)
- ❍ 6-9 years (3)
- ❍ 10 or more years (4)

Figure 22. Section A, Part 1. Demographics and qualifications.

Q10 Who do you report to in your company / organization?

- ❍ CEO / President (1)
- ❍ CFO / Treasurer / Finance (2)
- ❍ COO / Chief Administrative Officer (3)
- ❍ Board / Board Member (4)
- ❍ Business unit, function, or department executive / Vice President (e.g., engineering, sales, manufacturing, marketing) (5) _____
- ❍ Other (specify): (6) _____

Q11 How many levels or positions are between you and the top management person (e.g., CEO, President, General Manager) of the company / organization?

- ❍ 0 - I am the top management person (1)
- ❍ 1 (2)
- ❍ 2 (3)
- ❍ 3 (4)
- ❍ 4 (5)
- ❍ 5 or more (6)

Q12 Which industry sector best describes your company's / organization's line of business?

- ❍ Choose Not to Disclose (1)
- ❍ Agriculture & Natural Resources (2)
- ❍ Arts, Media, & Entertainment (3)
- ❍ Building Trades & Construction (4)
- ❍ Consulting & Contracting Services (5)
- ❍ Education, Child Development, & Family Services (6)
- ❍ Energy & Utilities (7)
- ❍ Engineering & Design (8)
- ❍ Fashion & Interior Design (9)
- ❍ Financial Services (10)
- ❍ Food & Beverage (11)
- ❍ General Manufacturing & Product Development (12)
- ❍ Health Science & Medical Technology (13)
- ❍ Hospitality, Tourism, & Recreation (14)
- ❍ Information Technology & High Tech (15)
- ❍ Marketing, Sales, & Service (16)
- ❍ Non-profit Organization (17)
- ❍ Public & Government Services (18)
- ❍ Transportation (19)
- ❍ Other (20)

Q13 If you work for a for-profit company / organization, is it _____

- ❍ Privately held (1)
- ❍ Publicly traded (2)

Q14 What is your age? _____ (two-digit number)

Q15 What is your gender?

- ❍ Male (1)
- ❍ Female (2)

Figure 23. Survey Section A, Part 2. Demographics and qualifications.

Table 12

Survey Section B. Major Construct/Question Matrix, Part 1

Construct Elements	Description
Construct	Monetary Incentives (independent variable)
Construct Definition	The extent to which potential adopters perceive monetary incentives (e.g., incentive pay, future raises, etc.) are considerations for decisions
Questions That Measure The Construct	16-20
Questions Derived From	Young, Beckman, and Baker (2012) Eisenhardt (1989)
Construct	Advancement (independent variable)
Construct Definition	The extent to which potential adopters perceive advancement (e.g., increased title, responsibilities, staff size, etc.) is a consideration for decisions
Questions That Measure The Construct	21-25
Questions Derived From	van der Heijden (2002) Young, Beckman, and Baker (2012) Eisenhardt (1989)
Construct	Recognition and Satisfaction from Accomplishments (independent variable)
Construct Definition	The extent to which potential adopters perceive satisfaction from accomplishments (e.g., goal achievement, future opportunities for greater challenges, team association, etc.) are considerations for decisions
Questions That Measure The Construct	26-30
Questions Derived From	Reeve, Ryan, Deci, & Jang (2007) Cabanac (1992)
Construct	Fear of Job Termination or Demotion (independent variable)
Construct Definition	The extent to which potential adopters perceive fear of job termination or demotion (e.g., incentive pay, future raises, etc.) is a consideration for decisions
Questions That Measure The Construct	31-35
Questions Derived From	Bendovschi, Tinca, Ionescu, & Plescan (2014)
Construct	Fear of Diminished Personal Image (independent variable)
Construct Definition	The extent to which potential adopters perceive fear of diminished personal image (e.g., embarrassment, exposure, loss of respect from peers, etc.) is a consideration for decisions
Questions That Measure The Construct	36-40
Questions Derived From	Bendovschi, Tinca, Ionescu, & Plescan (2014) Tashkandi and Al-Jabri (2015)

Table 13

Survey Section B. Major Construct/Question Matrix, Part 2

Construct Elements	Description
Construct	Top Management Support (independent variable)
Construct Definition	The extent to which potential adopters perceive top management support (e.g., willingness to take risks, display leadership for IT initiatives, views IT as a trusted partner, etc.) is a consideration for decisions
Questions That Measure The Construct	41-45
Questions Derived From	Low, Chen, and Wu (2011) Tornatsky and Fleischer (1990) Tashkandi and Al-Jabri (2015) Espadanal and Oliveira (2012) Williamson (1985)
Construct	Pattern of Technology Readiness (independent variable)
Construct Definition	The extent to which potential adopters perceive a pattern of the company/organizational technology readiness (e.g., initiative regularity, experienced IT staff, strong user training program, strength of social relationships, "can do" culture, etc.) is a consideration for decisions
Questions That Measure The Construct	46-50
Questions Derived From	Rai, Sahoo, and Mehfuz (2015) Espadanal and Oliveira (2012) Rogers (1995)
Construct	Cloud Computing Services Adopted (dependent variable)
Construct Definition	The measure of the level of adoption for major cloud computing services
Questions That Measure The Construct	51-58
Questions Derived From	*Survey on Cloud Computing (2014)* Smith and Gonzalez (2014) Venkatesh and Davis (2000) Sledgianowski and Kulviwat (2009)

Q16-20 How important are the following personal monetary incentive factors when making major decisions?

	Very Unimportant	Unimportant	Neither Important nor Unimportant	Important	Very Important
Q16. Potential impact on all forms of incentive pay (e.g., bonuses, stock options, etc.)	☐	☐	☐	☐	☐
Q17. Potential impact on future salary increases	☐	☐	☐	☐	☐
Q18. Potential impact on receipt of in-lieu-of money items (e.g., automobiles, expense allowances, additional vacation days, etc.)	☐	☐	☐	☐	☐
Q19. Fear of potential salary reduction of 5% or more	☐	☐	☐	☐	☐
Q20. Potential impact on receipt of non-monetary awards (e.g., reserved parking spaces, access to special dining rooms, etc.)	☐	☐	☐	☐	☐

Figure 24. Survey Section C. Monetary incentives questions.

Q21-25. Using the agreement scale provided, please indicate the extent to which each statement describes your opinion.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Q21. Demonstrating a linkage between key business and IT strategies increases my chances for promotion	☐	☐	☐	☐	☐
Q22. Successfully completing innovation IT projects increases my chances for promotion	☐	☐	☐	☐	☐
Q23. Demonstrating an understanding of the needs of my business peers increases my chances for promotion	☐	☐	☐	☐	☐
Q24. Successfully completing innovative IT projects will lead to more opportunities to take on similar projects	☐	☐	☐	☐	☐
Q25. Successfully completing innovative IT projects will make my boss look good which increases my chances for promotion	☐	☐	☐	☐	☐

Figure 25. Survey Section D. Advancement questions.

Q26-30. Using the agreement scale provided, please indicate the extent to which each statement describes your opinion.

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
Q26. The recognition I receive from my company / organization for my individual contributions / accomplishments adds to my personal satisfaction	☐	☐	☐	☐	☐
Q27. The recognition I receive from my IT industry peers for my individual accomplishments adds to my personal satisfaction	☐	☐	☐	☐	☐
Q28. The recognition I receive from my social community for my individual accomplishments adds to my personal satisfaction	☐	☐	☐	☐	☐
Q29. I experience satisfaction from my personal accomplishments	☐	☐	☐	☐	☐
Q30. I experience satisfaction from my staff's / team's accomplishments	☐	☐	☐	☐	☐

Figure 26. Survey Section E. Recognition and satisfaction from accomplishments.

Q31-35. Using the agreement scale provided, please indicate the extent to which each of statements below describe your opinions.

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
Q31. Risk takers who are deemed to have failed are punished in my company / organization	☐	☐	☐	☐	☐
Q32. A system failure that results in the unauthorized release of confidential data would likely harm my reputation within my company / organization	☐	☐	☐	☐	☐
Q33. A system failure that results in the unauthorized release of confidential data would likely lead to my termination	☐	☐	☐	☐	☐
Q34. If terminated, I would fear for the job security of my current staff	☐	☐	☐	☐	☐
Q35. If terminated, it would be difficult to secure an equivalent position with another firm within 6 months	☐	☐	☐	☐	☐

Figure 27. Survey Section F. Fear of job termination or demotion questions.

Q36-40. Using the agreement scale provided, please indicate the extent to which each of statements below describe your opinions.

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
Q36. A system failure that results in the unauthorized release of confidential data would likely damage my professional image	☐	☐	☐	☐	☐
Q37. A system failure that results in the unauthorized release of confidential data would likely lead to a loss of personal respect from my IT industry peer group	☐	☐	☐	☐	☐
Q38. A system failure that results in the unauthorized release of confidential data would likely lead to a loss of personal respect from my company's / organization's executive management	☐	☐	☐	☐	☐
Q39. A system failure that results in the unauthorized release of confidential data would likely lead to a loss of personal respect from my company's / organization's employees	☐	☐	☐	☐	☐
Q40. A system failure that results in the unauthorized release of confidential data would likely lead to a loss of respect from my social community	☐	☐	☐	☐	☐

Figure 28. Survey Section G. Diminished personal image questions.

Q41-45. Using the agreement scale provided, please indicate the extent to which each of statements below describe your opinions.

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
Q41. Senior management believes IT is aligned with the goals of our business	☐	☐	☐	☐	☐
Q42. Senior management provides strong leadership and engages in the process when it comes to new IT initiatives	☐	☐	☐	☐	☐
Q43. Senior management recognizes IT achievements	☐	☐	☐	☐	☐
Q44. Senior management is willing to take risks involved in the adoption of new technologies	☐	☐	☐	☐	☐
Q45. Senior management views the CIO as a trusted partner	☐	☐	☐	☐	☐

Figure 29. Survey Section H. Top management support questions.

Q46-50. Using the agreement scale provided, please indicate the extent to which each of statements below describe your opinions.

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
Q46. The employees in my company / organization largely embrace new technologies	☐	☐	☐	☐	☐
Q47. My company / organization ensures employees are adequately trained when introducing new technologies	☐	☐	☐	☐	☐
Q48. My IT staff is experienced in implementing new technologies	☐	☐	☐	☐	☐
Q49. Senior management knows how IT can be used to support business operations	☐	☐	☐	☐	☐
Q50. In my company / organization, adoption of new technologies occurs on a regular basis	☐	☐	☐	☐	☐

Figure 30. Survey Section I. Pattern of technology readiness questions.

Q59-66. How important is each of these factors in your decision to adopt cloud services?

	Very Unimportant	Unimportant	Neither Important nor Unimportant	Important	Very Important
Q59. Ability to match dynamically IT capacity to demands of business	☐	☐	☐	☐	☐
Q60. Ongoing IT cost predictability	☐	☐	☐	☐	☐
Q61. One-time cost of conversion	☐	☐	☐	☐	☐
Q62. Turning over direct control of specific IT operations to a third party	☐	☐	☐	☐	☐
Q63. Industry reputation of the cloud service provider	☐	☐	☐	☐	☐
Q64. Cloud service provider's ability to integrate	☐	☐	☐	☐	☐
Q65. Cloud service provider’s operational flexibility	☐	☐	☐	☐	☐
Q66. Top management understands the benefits of adopting cloud computing	☐	☐	☐	☐	☐

Figure 31. Survey Section J. Cloud computing services adopted questions.

Q51-58. My company / organization is currently using or is planning to use the _____ cloud computing service within the next 6 months.

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
Q51. Private / Internal Cloud	☐	☐	☐	☐	☐
Q52. Software as a Service	☐	☐	☐	☐	☐
Q53. Platform as a Service	☐	☐	☐	☐	☐
Q54. Infrastructure as a Service	☐	☐	☐	☐	☐
Q55. Communications as a Service	☐	☐	☐	☐	☐
Q56. Storage as a Service	☐	☐	☐	☐	☐
Q57. Network as a Service	☐	☐	☐	☐	☐
Q58. Other _____	☐	☐	☐	☐	☐

Figure 32. Survey Section K. Cloud computing services adoption factors questions.

Q67-73. Using the agreement scale provided, please indicate the extent to which each of statements below describe your opinions. In this section:

- "Non-mission critical" is defined as "a system whose failure ***would not*** result in a severe impact on ongoing business operations."
- "Mission critical" is defined as "a system whose failure ***would*** result in a severe impact on ongoing business operations."
- "Mission critical" is defined as "a system whose failure ***would*** result in a severe impact on ongoing business operations."

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
Q67. My organization currently uses cloud computing services for mission critical applications	☐	☐	☐	☐	☐
Q68. My organization has plans to use additional cloud computing services for mission critical applications					
Q69. My organization currently uses cloud computing services for non-mission critical applications	☐	☐	☐	☐	☐
Q70. My organization has plans to use additional cloud computing services for non-mission critical applications					
Q71. My organization supports the use of cloud computing services	☐	☐	☐	☐	☐
Q72. Previous working experience with a cloud service provider was / will be important in the selection decision	☐	☐	☐	☐	☐
Q73. My organization plans to increase its number of cloud computing applications within 6 months	☐	☐	☐	☐	☐

Go to Q76

Figure 33. Survey Section L. Cloud usage intentions questions.

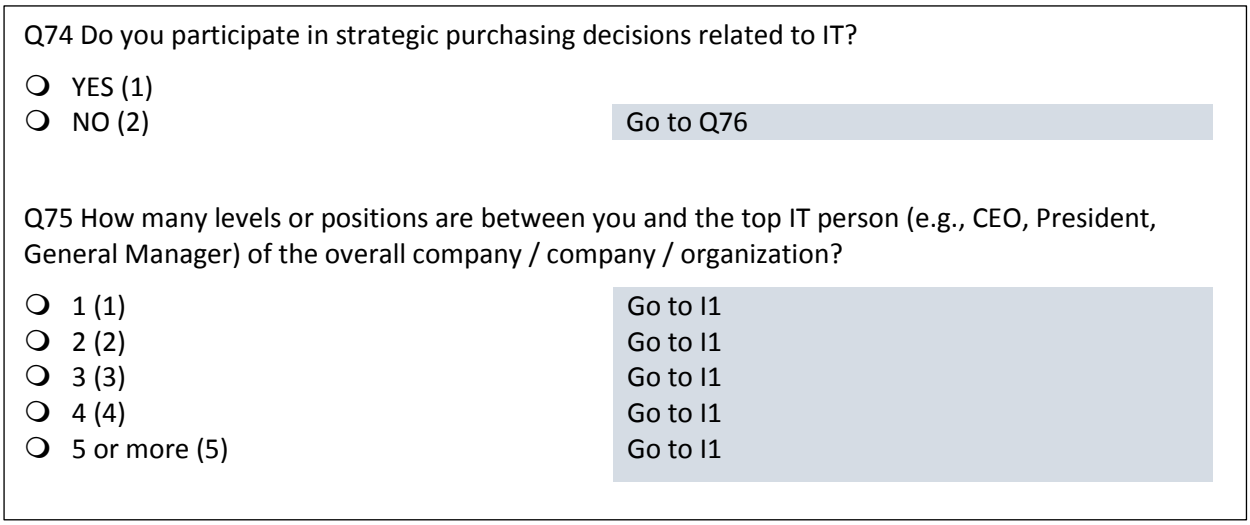


Figure 34. Secondary qualifications questions.

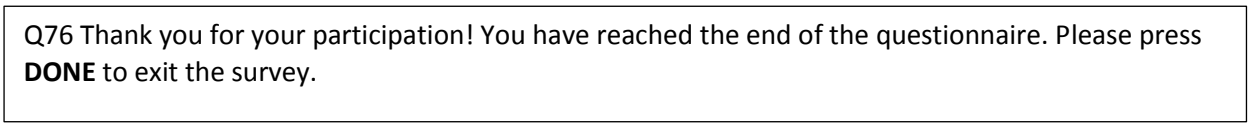
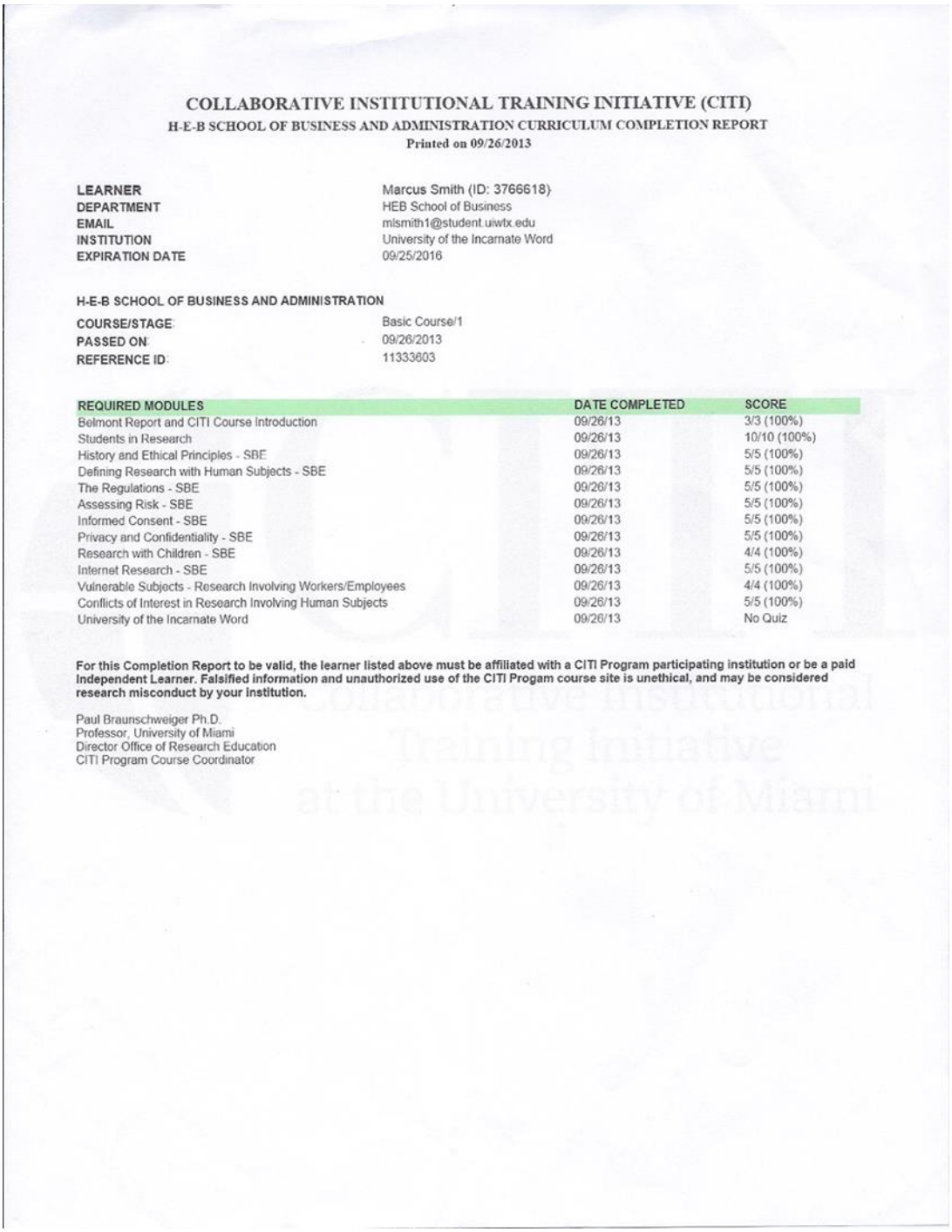


Figure 35. Survey completion notification.

Appendix B
CITI Certificate



COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI)

H-E-B SCHOOL OF BUSINESS AND ADMINISTRATION CURRICULUM COMPLETION REPORT

Printed on 09/26/2013

LEARNER	Marcus Smith (ID: 3766618)
DEPARTMENT	HEB School of Business
EMAIL	mlsmith1@student.uiwtx.edu
INSTITUTION	University of the Incarnate Word
EXPIRATION DATE	09/25/2016

H-E-B SCHOOL OF BUSINESS AND ADMINISTRATION

COURSE/STAGE:	Basic Course/1
PASSED ON:	09/26/2013
REFERENCE ID:	11333603

REQUIRED MODULES	DATE COMPLETED	SCORE
Belmont Report and CITI Course Introduction	09/26/13	3/3 (100%)
Students in Research	09/26/13	10/10 (100%)
History and Ethical Principles - SBE	09/26/13	5/5 (100%)
Defining Research with Human Subjects - SBE	09/26/13	5/5 (100%)
The Regulations - SBE	09/26/13	5/5 (100%)
Assessing Risk - SBE	09/26/13	5/5 (100%)
Informed Consent - SBE	09/26/13	5/5 (100%)
Privacy and Confidentiality - SBE	09/26/13	5/5 (100%)
Research with Children - SBE	09/26/13	4/4 (100%)
Internet Research - SBE	09/26/13	5/5 (100%)
Vulnerable Subjects - Research Involving Workers/Employees	09/26/13	4/4 (100%)
Conflicts of Interest in Research Involving Human Subjects	09/26/13	5/5 (100%)
University of the Incarnate Word	09/26/13	No Quiz

For this Completion Report to be valid, the learner listed above must be affiliated with a CITI Program participating institution or be a paid independent Learner. Falsified information and unauthorized use of the CITI Progam course site is unethical, and may be considered research misconduct by your institution.

Paul Braunschweiger Ph.D.
Professor, University of Miami
Director Office of Research Education
CITI Program Course Coordinator

Figure 36. CITI certificate for Marcus Smith.