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Organizational Cultural Factors that Enhance the Adoption of Innovation in The United States of America

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Abstract

This study focuses on the adoption of innovation within organizations in the United States of America. There was a significant amount of research on the diffusion and adoption of innovation at an individual level. Significant work has been done on organizational culture, leadership, and success as well as project management. Less work has been done on organizational culture and project success; however, the competing values framework points to the elements of a successful TQM implementation, and success of leadership and functions within various organizational cultures. This study uses the competing values framework to assess the dominant culture of the organization, and tests whether there is a relationship between culture and the intention to adopt an innovation, the expected outcomes of an innovation, and the successful adoption of innovation. An online survey was used to collect 303 responses. The research found the first null hypothesis that stated there is no correlation between culture type and whether the firm had introduced an innovation in the last three and one-half years was rejected. There is a statisically significant correlation between the control (negative) and clan (positive) dominant cultures. The second null hypothesis that stated there is no statistical correlation between project management best practices and organizational culture as an intervening factor and the successful implementation of an innovation was rejected. The third null hypothesisthat stated there is no significant relationship between the dominant organizational culture and expected innovation outcome and innovation successwas partly rejected. There was a positive correlation between organizational culture and innovation implementation success; however, at a 95% confidence level,there was no statistical significance to reject the null hypothesis between organizational culture and expected outcomes with implementation success.

Keywords: organizational, culture, innovation, competing values framework

Declaration - Signature

"I declare in lieu of an oath that I have written this doctoral thesis by myself, and that I did not use other sources or resources than stated for its preparation. I declare that I have clearly indicated all direct and indirect quotations, and that this thesis has not been submitted elsewhere for examination purposes or publication."

October 27th, 2016 __ *Thomas Kobelt*

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I certify that I have read this dissertation and that, in my opinion, it is fully adequate in scope and quality as a doctoral thesis.

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Table of Contents

List of Figures

List of Tables

List of Abbreviations

AICc	Akaike Information Criterion (corrected)
ATS	Association of Theological Schools
CFO	Chief Financial Officer
CVF	Competing Values Framework
EE	Effort Expectancy
ERP	Enterprise Resource Planning
ET	Emerging Technology
FC	Facilitating Conditions
HR	Human Resources
IT	Information Technology
MIS	Management Information System
OCA	Organizational Cultural Assessment
PE	Performance Expectations
SI	Social Influence
TAM	Technology Acceptance Model
TQM	Total Quality Management
UTAUT	Unified Theory of Acceptance and Use of Technology

List of Appendices

Chapter 1: Overview

With trillions of dollars US wasted every year on failed innovations, and in particular failed IT implementation projects, there have been many studies on why IT projects fail. As reviewed by Shore, (2008) the biases and culture of organizations and their teams lead to massive failures. This included well known engineering and IT public failures such as the Columbia Space Shuttle explosion, The Denver Airport Baggage Handling System, and the NYC Subway Communications system. Shore (2008) covered eight major failures. More recently, Kanaracus (2013) reviewed five major public system implementation failures. One example between IBM and the Queensland Health payroll system cost the taxpayers of Australia $1.2 billion Australian dollars with apparently no legal recourse (Kanaracus, 2013). While most of the big project failures appear to involve government, smaller projects occasionally do hit the media. A case in point is the lawsuit between IBM and Bridgestone Tire (Krigsman, 2013). After $75 million US dollars were spent attempting to implement the system, Bridgestone sued IBM for $600 million US dollars. Not only was the money wasted on a failed project, additional money will be spent by both sides on lawyers and PR firms with no tangible outcome from the project.

This chapter reviews the problem and some approaches intended to provide a better understanding of the issue. There are many project management studies that have defined a number of best practices. Regardless of the project management best practices there are still trillions of dollars wasted on failed projects (Krigsman, 2012). This chapter reviews the problem and works towards a better organizational cultural understanding. Project management is well defined and needs a more nuanced understanding of the organizational cultural context – the soil where the seed for innovation is planted – to enhance the adoption of innovation.

Problem Statement

There is a body of literature that describes the adoption of innovation, and in particular the adoption of IT, from a project management perspective. Al-Ahmad (2009) provided a general framework for project failure and deduced six major factors in project failure. Kappelman (2006) researched the early warning signs of IT project failure. The Standish Group's surveys from 1994 to 2014 identified and published the trends of major factors for IT project failure. The Standish Group (1996) published Cobb's Paradox, which has been quoted in many publications and is readily available over the internet with 52,800 references in Bing and 441,000 references found through Google. Cobb's statement includes: "We know why projects fail, we know how to prevent their failure – so why do they still fail?" (as cited in Standish Group, 1996).

The technical, process and organizational factors for IT project failure and success are known so why do they still fail? Very little research on the organizational cultural factors exists to directly explain Cobb's Paradox. Carl and Freeman (2010) hypothesize that there are non-stationary factors such as staff turnover and requirement changes that cause large projects to fail. One solution from their report is to implement smaller projects so that turnover in users, managers, and owners, and changes in their expectations, are minimized. Implementing smaller projects and emphasizing greater user involvement is worthwhile and also documented under Nelson's (2007) best practices.

Two major theories address the stationary factors of IT project success or improved rates of adoption. They include the Technology Acceptance Model proposed by Davis (1989) and the Innovation Diffusion Theory proposed by Rogers (2003). To simplify, but not denigrate Davis, technology has a higher adoption rate if it is perceived to be useful and easy to use. Rogers's

initial study was the implementation of hybrid corn by Iowa farmers. He describes a technology acceptance curve with innovators, early adopters, the early majority, the late majority, and the laggards. He also describes the factors of innovation, at an individual level, of relative advantage, compatibility, complexity, trainability, and observability. His descriptions have been applied to many cases and cultures. Moore (2002) expands on the technology acceptance curve and indicates that there is a major chasm between the values and motivations of the early adopters and the early majority.

Van Everdingen and Waarts (2003) conducted a study of ERP implementation among ten European nations and they found strong correlations between ERP adoption rates and four of the six of Hofstede's country cultural dimensions. Their research pointed in the direction of innovation and cultural factors at a national level; however, there were firms in each nation that had success and failure in their adoption of ERP when, at a national level, the prediction would have been otherwise. At a macro level, national culture may explain or give some propensity for IT project success or failure.

IT project failures are only one type of innovation adoption failure. Carr (2003) wrote that based on the ubiquitous nature and the permeation of IT in many aspects of life and business, the technology does not matter as much as the management of the technology resource. It now becomes an issue of organizational leadership to seize the technology and use it in new ways. The innovation is not in the technology itself, but in the adoption of the technology to the organization. The general hypothesis is that the culture of the organization would be a much better predictor for the successful adoption of a particular innovation.

Purpose of Research

The purpose of the research was to explore the relationship between the dominant organizational culture and the expected innovation outcomes to determine whether the adoption of certain types of innovations would be more successful than others. This may further differentiate and explain why, despite using the best project management practices, some projects fail when they would otherwise be expected to succeed.

The purpose of the research was not about leadership and changing organizational culture, neither was it about the generation of innovation. The research started at the point an organization decides to adopt an innovation. It attempted to describe why two seemingly identical organizations in terms of size, industry, and project management practices, would have two very different results when both would have been expected to succeed.

Significance of the Study

Overall, billions of dollars are wasted each year on false starts and IT initiatives that are bound to fail (The Standish Group, 2014). Krigsman(2012) had earlier criticized estimates of the global annual cost of IT failure of six trillion dollars as being too high. The controversy, using the Standish Group's definition of project failure, of projecting those costs of IT project failures in the United States and generalizing those statistics for the global economy sets the annual cost of failure at six trillion dollars a year. Krigsman (2012) references two other experts and their calculations target the global cost of IT failure at three trillion dollars a year. There are potential problems with any of these estimates as it is not safe to assume the same level of expenditure on IT projects or the same rate of failure across all national economies. Regardless of whether it is three trillion, six trillion, or the most conservative estimate of 1.2 trillion US dollars of waste each year it is a significant amount of waste that could be redirected (Krigsman 2012).

The lack of appropriate resources or the lack of project management is not why the implementation of an innovation may fail. A better understanding of the culture of the organization and the expected outcomes of the project would be a better predictor of project success. The author would posit that some expected project outcomes would not fit the culture so they should be expected to fail. To use the technology acceptance model to the organization as a whole, the organization would need to see the usefulness of the technology. Knowing that a particular innovation would be rejected outright based on the expected outcomes would inform management that they would need to sell the innovation based on other outcomes, or reconsider whether or not the innovation fits in the organization.

Research Design

The basis for the survey was the Competing Values Framework, a survey instrument which has been validated with over 100,000 results to measure organizational culture (Cameron & Quinn 2011). Permission to use the survey was granted and the survey was extended to include questions on the number of innovations, the expected outcomes, and whether the implementation met the expected outcome. Questions, related to project management best practices, were added based on the Standish Group's project success factors from their 2014 Project Smart Report.

Research Question and Hypotheses

The research sought to test whether the successful innovation adoption is dependent on the successful combination of the two independent variables of organizational culture and expected innovation outcome. Damanpour (1996) indicated that mechanistic or bureaucratic cultures are not as successful in the adoption of innovation. The hypothesis was then more nuanced based on the four cultural tendencies identified by Cameron and Quinn (2011). The

success of the adoption of innovation would be probable if it is seen as strengthening the desired culture of the organization. The underlying reason why big projects fail in big organizations is not just the lack of user involvement or management support which is the top two items for failure as identified by the Standish group. Typically, the large organization would tend to a hierarchical control culture. The "buy in" of the organization would have to flow with the needs of efficiency, smooth functioning, and predictability. This type of culture would not have a high tolerance for ambiguity.

H1): To confirm the earlier theories of mechanistic or bureaucratic cultures, there is negative correlation between uncertainty avoidance and the adoption of innovation.

H2): To confirm Cobb's Paradox and move beyond the Standish Group's best management practices, there is a correlation between the top ten best practices and project success or failure. It may be necessary; however, it is not sufficient for the successful adoption of an IT innovation. The dominant organizational culture is an intervening factor for the successful implementation of an innovation.

H3): Understanding that organizational culture is the soil for the successful growth and adoption of innovation, there is a statistically significant relationship between the expected project outcomes and specific dominant cultures as defined using the Competing Values Framework.

Assumptions and Limitations

By sampling in the United States, the national cultural factors were held constant. By using Survey Monkey Audience, a truly random selection of American managers being surveyed was expected. The main sample had a much lower percentage of organizations attempting to introduce any innovation versus the pretest. The pretest of Graduate Theological Schools was

not truly representative of organizations in North America as Higher Education, with declining enrollment, is under pressure to innovate. A higher percentage of Graduate Schools introduced an innovation than was found in the general population.

Operational Definitions

Innovation. Rogers (2003) defined *innovation* as an idea, product, process, or service that is perceived to be new to an individual or a group or an organization.

Organizational culture. Schein(2010) mentioned that *organizational culture* can be measured at three levels. The initial level starts with the artifacts and moves to the espoused beliefs and values to get to the core or basic underlying assumptions. Hofstede (2010) discussed the research on culture starts with the measurement of values. Cameron and Quinn(2011)posited that culture includes the core values of the organization and the interpretation of how things are. *Organizational culture*, as opposed to *national culture* or *individual culture*, is represented in the shared values of the organization.

Summary

Given the continued high degree of waste in failed innovation initiatives, there is still opportunity to expand one's understanding on the adoption of innovation and in particular the adoption of IT projects. Project management best practices are continuing to be revised and the Standish Group has continued to publish project statistics as well as project assessment tools and project management training (The Standish Group, 2013). A more inclusive and intersectional approach is required to build a more integrative model of innovation adoption. The next chapter will cover a brief overview of literature on technology adoption and organizational culture. It is expected that a greater understanding of organizational culture will provide a better predicitive model for the adoption of innovation.

Chapter 2: Literature Review

The organizational cultural factors that lead to the successful adoption of innovation are at the intersection of the literature on innovation adoption and organizational culture. This study sought to confirm that successful innovation adoption is dependent on the successful combination of the two independent variables of organizational culture and the expected innovation outcome. This chapter reviews the adoption of innovation, particularly in the two dominant models of the Innovation Diffusion theory put forward by Rogers (2003) and the technology acceptance model (TAM) put forward by Davis (1989). There were significant research studies available on this topic relating to the adoption of innovation by indivduals. There also were research studies available on the adoption of innovation by organizations within various nations. The national cultural factors, and finally the organizational cultural factors,were explored within the context of measuring culture and the adoption of innovation.

This study used the Competing Values Framework to measure the dominant organizational culture, and explored the dominant culture of the organization and the expected outcomes of the innovation to determine if there were positive correlation clusters for the successful adoption of innovation.

Theoretical Orientation

This study sought to confirm that successful innovation adoption was dependent on the successful combination of the two independent variables of organizational culture and expected innovation outcome. Previous research was that mechanistic or bureacratic cultures are not as successful in the adoption of innovation. The hypothesis was then more nuanced based on the four cultural tendencies identified by Cameron and Quinn (2011). The success of the adoption of innovation would be probable if it is seen as strengthening the desired culture of the

organization. Cooper and Quinn (1993) touched on this theme when they discussed evaluating the effectiveness of IT for the firm. They postulated that MIS effectiveness was not an economic construct, but that MIS effectivness should be measured to the extent that it supports management and organizational effectiveness.

Review of Literature

The organizational cultural factors that lead to successful adoption of innovation are at the intersection of the literature on innovation and organizational culture. Johansson's(2006) thesis was that at the intersection of cultures and disciplines, one gets creative ideas. He gave the example of the Medici family in Florence, Italy during the middle of the 1400s when they financed works from a variety of crafts, and allowed people to converge from a variety of places and trades to build a creative ecosystem. He described two types of innovation: one as directional ideas and the other as intersectional ideas. He described the combination of 'random' ideas or concepts from different contexts or situations as intersectional. The ideas were not new, but they were innovative within a new context. Johansson continued his work by giving exercises to break-down barriers and to consider multiple perspectives on a problem.

Background of innovation. Martin (2007) described the opposable mind as being able to hold multiple perspectives. He described a stance as a worldview that is used to filter and interpret events through one's model of reality. It was used to filter complexity and could be used to reinforce existing models, or be used to revise and build better models of reality. At a personal skills level, Martin (2009) wrote about integrative thinking that allows one to hold two opposing truths and provide a synthesis to a more creative solution. He gave an example of a conflict where both parties were coming from two different perspectives when coming back from a client visit. They were in the same meeting and had opposing views of what that meeting with

the client meant. The two parties used their default mental models to build their own constructs, understanding of the meeting, and a solution. Martin reminded the reader that the mental model is a model of reality, whereas the two parties see their model of reality as reality. To borrow from Plato's analogy of the cave, the perception of reality is only shadows of reality. A far richer, more valuable understanding of a client, the market, or the problem would come from a synthesis of the mental models. Martin (2009) worked through a person's stance, tools for reasoning, and their experience to help individuals develop integrative reasoning. Martin (2009) pushed the reader from "thinking harder", which is an incremental or exploitive innovation, to using new tools and perspectives to gain a creative understanding of their market, its segments, and the consumer's ultimate consumption needs to an exploration in their innovation.

The topic of business innovation has been around for some time and it would be remiss not to include Christensen's (1997) research. Christensen studied various industries including the development of the Hard Drive Storage and the Steel industry, and went into detail on the innovations of the Hard Drive industry. Leaders such as IBM were established and continued their dominance in delivering new technology advances on hard drives to their existing customers. They were successful in delivering continued performance increases and improved value along a slope that satisfied the mainframe and the mini-computer market.

When a new cheaper disk drive storage technology was developed, but did not deliver the improved performance for the mini-computer market, it was made available to the desktop market. The new 5.25 disk drives had less capacity; were slower; cost more per unit stored, but cost less as a total unit; and were more compact than the existing market drives. They were good enough for the emerging personal computer market. The 5.25-inch drive became a disruptive technology. It met an underserved market space and improved over time along a new trajectory

to overtake the established 8-inch drives. Over time, history was to repeat itself as the development of the 3.5-drive technology would overtake the 5.25-drive market. Currently, the technology trajectory of solid state drives should spell the death of the hard drive business.

Christensen (1997) described part of the problem of technology innovation as being embedded in a value network. He discussed technology 'S' curves of product performance in sustaining technological innovation. Disruptive innovation was outside of the value network and performance was measured on different attributes. Whether it was a product or a service, Christensen's 'S' curves of technology adoption reflected the industry's change with the introduction of new technology. Christensen's study showed how a company in a sector could dominate the market, and then eventually get replaced with another competitor with a newer technology. Typically the new technology was cheaper. It could be slower or have less capacity, but it was good enough for one segment of the market. Eventually the technology would improve and capture a greater part of the market.

As Martin (2009) described value creation in business, he also described the characteristics of exploitation and exploration. Exploitation is much like directional innovation. It is incremental and along a known technology path. It is lower risk and systematic, and the challenge for business is to maximize the exploitation of the resource or process before it is exhausted or rendered obsolete. Hard Drive manufacturers will continue to exploit hard drive technology and find new markets for that technology until the solid state drive renders the hard drive obsolete. Exploration, like the intersectional idea, is dynamic, high risk, and uncertain. The implementation of a new idea starts with the mystery of the problem to be solved, or the client need. It moves from exploring the problem to developing the heuristic. Eventually, the business will want to minimize risk and encompass the new heuristics into an algorithmic solution with its

policies, processes, and procedures. Once successful, the new path found through exploration will be developed further through exploitation.

Christensen and Raynor (2003) updated Christensen's (1997) work to focus on disruptive innovation. The first thing to note is their idea that an organization can not disrupt itself. Therefore, they provided a framework for organizations to find and develop innovations to better serve underserved markets. In doing so, organizations may disrupt their existing market. The focus on innovation was market focused. There was an assumption that certain organization values, being externally focused, would drive exploration and innovation.

Carr (2003) stated that IT does not matter since it is so ubiquitous. It is the platform or tool that allows for innovation. At the time of Carr's article in Harvard Business Review the book entitled "Unleashing the Killer App: Digital Strategies for Market Dominance" by Downes and Mui, (1998) had been out for a few years. It was heavily promoted by consulting firms and IT companies such as IBM. The idea was to get executives up to speed on these new technologies and build a digital competitive advantage. Firms such as Federal Express had built a competitive advantage in package delivery. Then they had augmented that advantage with their FEDship program where a shipper could enter the shipping information, and get the status and delivery confirmation online. This was new innovative technology for the time. While the technology gave Federal Express a short-term advantage, UPS and other package delivery companies also were able to provide the same information over time. Carr's (2003) argument was that now the technology is readily available. So technology alone does not provide a sustainable competitive advantage.

McGrath (2013) stated there is no such thing as a sustainable advantage. She reviewed companies in high velocity turbulent environments and stated that the advantage is transient;

whether it is two months or two decades, the advantage will fade in favor of something else. Yahoo was replaced by Google and MySpace was replaced by Facebook. A firm needs to respond, or be proactive, to reconfigure itself for the next big thing. Competitors will copy the advantage. It was a similar and updated argument of Carr's (2003) thesis. Ideas alone are plenty; it is the factors of national and corporate culture that allow for the recognition and adoption of innovation that keep an organization competitive.

Halaweh (2013) discussed emerging technology and summarized the nature of emerging technology. Of the six factors he covered (uncertainty, network effect, costs, unobvious impact, limited availability and not fully researched), uncertainty was the most common factor in the definition of emerging technologies. As technology matures and stabilizes, its availability grows and its value increases with increased usage. A background to Halaweh (2013) is the Technology Acceptance Model (Davis, 1989) and Innovation Diffusion Theory (Rogers, 1995). Rogers more recent fifth edition (2003) was updated to include the diffusion of ideas and innovation through the Internet.

Rogers (2003) and Moore (1991) shared a normal curve and then segmented it with those who were early and later to adopt innovation. Moore addressed technology adoption from a marketing perspective and introduced a chasm between innovators and early adopters (Figure 1). The initial communications of the value to be derived in the innovation is different between an innovator and mainstream adopter. The innovator is curious and will investigate the new technology or process for the sake of the newness. Innovators and Early Adopters see the technology for its intrinsic value and perceived benefits. Beyond the chasm is the majority; they are the two thirds of the market segment which are practical and are willing to see how the new technology is working for others before they are willing to commit. They are looking for a

solution to their problem. In other words, they are looking to adopt the innovation based on the expected outcomes of the adoption. Moore (2002) wrote his book addressed to high tech marketers, so they would they understand the dynamics of introducing an innovative solution to their market.

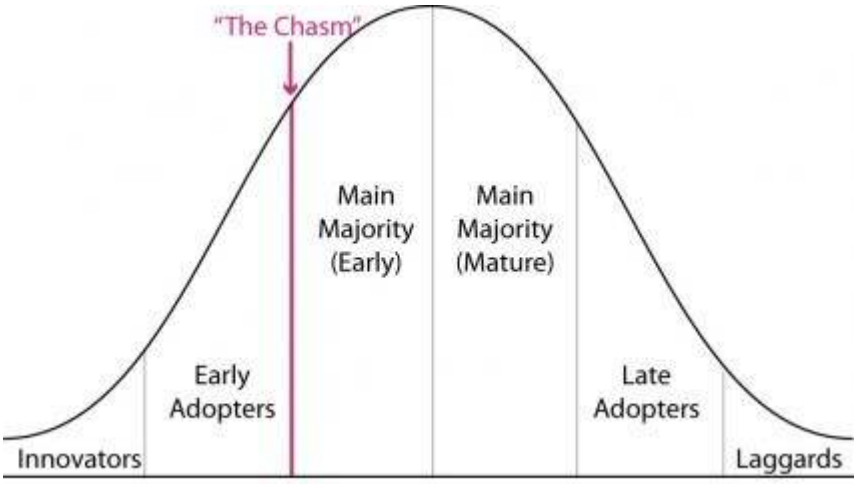

*Figure 1.*Moore's Modified Diffusion of Innovation Curve. Adapted from "*Crossing the Chasm",* by G. A. Moore (2002), (revised ed). New York: Harper Collins.

Rogers (2003) defined innovation as an idea, product, process, or service that is perceived to be new to an individual or a group or an organization. The idea does not need to be wholly new; it only needs to be new to the group. Rogers (2003) started to address the diffusion of innovation for organizations near the end of his work. His focus had been on the adoption of innovation by individuals. He noted once an organization has decided to adopt an innovation it is not automatic that it is implemented. Klein, Conn, and Sorra (2001) noted that it is not a failure of innovation, but a failure of implementation of the innovation. Their work focused on the implementation of the same ERP software between different manufacturing plants. The technology itself was held constant and the use of the software by organizational members resulted in the effectiveness of the innovation. They also noted that even if the technology was

implemented, it still may not result in the expected benefits. They gave an example of implementing software in a retail chain with the expectation of reduced waiting times and increased customer satisfaction. The expected increase in customer satisfaction may not occur as customers may be looking for something else that would increase their overall satisfaction.

The other explanation for the adoption of innovation is TAM (The Technology Acceptance Model). TAM was first developed by Davis (1989) and further tested, expanded, and developed by others over the decades. Venkatesh and Bala (2008) noted that TAM was developed to predict individual adoption. With TAM3, they had further nuanced the model by adding additional determinants to the perceived usefulness and perceived ease of use to the intention of adoption; however, TAM is still focused on the individual adoption of technology.

In 2003, Venkatesh, Morris, and Davis (2003) developed a unified view of TAM. Their work pulled together eight models that accounted for some variance with user intention to adopt technology. From the eight models, they proposed a unified model and tested the model with two new organizations. Venkatesh, Thong, and Xin (2012) noted that UTAUT (The Unified Theory of Acceptance and Use of Technology Model) had condensed the critical factors related to the adoption of technology within organizational contexts. It explained 70 percent of intention and 50 percent of technology use. There was still a noticeable gap between intention and use. Moghavvemi, Mohd Salleh, Zhao, and Mattila (2012) built on the UTAUT four core constructs. While performance expectations (PE) were considered the strongest predictor of intention, they also summarized that there were other mediating factors, such as external precipitating events, that impact intention and adoption. The propensity to act and significant life events will mitigate the action from intention to adoption. The UTAUT with the foundation of TAM, expanded for the organization, had the original two factors of performance expectations (PE) and effort

expectancy (EE) with the addition of social influence (SI) and facilitating conditions (FC). Social influence, within an organizational context, included how trusted peers and your supervisor view the technology and the level of assistance one could expect in learning the new technology. Facilitating conditions included how well funded the project was and the level of formal training and support.

A number of factors have been studied related to innovation and the firm. AbuJarad and Yusof (2010) tried to clarify innovation and adoption to facilitate a better understanding of the topic. AbuJarad and Yusof noted that innovation creation and adoption tend to get conflated into the same topic. The researchers observed that risk taking lies in the centre of innovation. They suggested that organizational cultures within firms that come up with a new idea and implement it are different from firms that adopt innovations. They recommended separating innovativeness from the adoption of innovation. A number of works, including Rogers (2003), where innovation was perceived to be the same as the adoption of innovation, were cited by AbuJarad and Yusof. Innovation and innovation adoption were two different concepts and structure a matrix (Table 1) of innovation creation versus adoption (AbuJarad and Yusof, 2010).

Table 1

Innovation Creation vs. Innovation Adoption

Creation	Adoption	
Create Radically	Adopt Radically	Radically
Create Incrementally	Adopt Incrementally	Incrementally

Source: AbuJarad and Yusof (2010)

The other axis was the nature of the innovation, whether it is incremental or more radical. AbuJarad and Yusof (2010) suggested that the problem of mixed results of various factors of

innovation was because the authors of the studies had conflated innovation creation and adoption. One has to be more aware of the context of innovation, rather than making blanket statements. The focus of the current research is on innovation adoption.

Van Everdingen and Waarts(2003) used Hofstede's cultural dimensions to determine the impact of elements of national culture on the adoption of innovation. This study was not confused between innovation creation and adoption. At that time, they used the adoption of ERP software, IT technology, as the proxy for corporate adoption of innovation. The nature of the technology was basically constant among the 2600 medium sized organizations spread across ten European countries. Their theory was that the adoption of IT innovation was dependent on some elements of national culture. It was confirmed that there was a correlation between Hofstede's Power Distance, Uncertainty Avoidance, and Long Term Orientation indexes and the adoption of IT innovation. This was at a national level. Within each nation, some companies did adopt or failed to adopt the innovation, regardless of whether at a national level, the national element of culture was present. The study found a correlation of a number of independent variables that impacted the adoption of a specific technology. Within each nation, every company had its own personality and culture. There may be other factors within the firm that would account for the successful adoption of innovation.

Koen, Bertels and Klenschmidt (2014) studied national culture and diffusion, and the findings also revealed a significant relationship between four of the six elements of Hofstede's measurements of national culture and the adoption of innovation. The study was helpful in using Hofstede's (2010) cultural factors for introducing an innovation to a national culture. While Kaasa and Vadi(2014) have also confirmed a correlation between national cultural factors and innovation, their correlation of innovation was based on patent data. This would be helpful in

terms of innovation creation; however, it does not directly give insight into the adoption of innovation. Autant-Bernard, Chalaye, Manca, Moreno, and Surinach(2010) explored both innovation creation and adoption. The result of this study was that there is a correlation between innovation creation and adoption within EU countries. The countries, as a whole, that exhibit a higher level of innovativeness also have a higher capacity for the adoption of innovation. The study also included some work at the industry sector level and they acknowledged that this is an area where more work needs to be done.

Tellis, Prabhu, and Chandy's (2009) study of national innovation found that corporate culture is a major factor in the commercialization of innovations. In their work, they measured organizational culture based on six factors which include: willingness to cannibalize, future focus, risk tolerance, use of incentives, product champions, and internal markets. Risk tolerance, or uncertainty avoidance,is a common cultural factor in many studies. In addition to these six organizational factors, they included Hofstede's national culture values, as well as coding for the use of national labour, capital, and government policies as independent variables for their study. In summary, they suggested that it is not the number of patents that would make Apple vs Sony successful. It is the corporate culture and willingness to cannibalize past successess and bring them to market – a successful output –that determines the adoption of radical innovation. This study was of major companies across seventeen countries. It gave the foundation for further research along many lines.

Shore (2008) reviewed eight major project failures and mapped them to nine systemic biases. He then mapped the systemic biases used in his article to the Competing Values Framework and found that the cases reviewed in his study had a project culture of stability and an internal focus. Mapping the project failure systemic biases to the competing values

framework leads one to the conclusion that innovation initiatives would tend to fail in the competing values framework "Control" quadrant.

Pasaoglu(2011) conducted a study of technology acceptance, in particular of ERP adoption among firms in Turkey, to determine what factors would influence firms to adopt the technology. Using TAM, it was not surprising that ease of use scored high in influencing the decision to adopt the technology; however "it was seen that the effect of organizational culture was remarkable"(Pasaoglu, 2011). Two organizational factors identified were employees collaborate and easily adapt to changes. These factors can also be mapped to the "clan", also known as collaborate, quadrant of the competing values framework.

Damanpour and Schneider(2008) as well as Damanpour and Schneider (2006) focussed on the adoption of innovation by organizations. In their 2006 study, they focussed on external or environmental conditions that would facilitate the adoption of innovation. In their 2008 study, the focus was on local US governmental organizations. They found some significance between urbanization, size, and resources, and the implementation of innovation.They also determined the nature of innovation as defined by the cost, complexity, and impact to the organization. They did not find any material correlation between complexity and implementation; however, they also noted that the type of innovation studied was administrative and incremental(p.510).They also explored managers demographics and their personal characteristics to determine if there was any influence on the adoption of innovation. In many cases, there was no significant effect on the adoption of innovation; however, they did find some impact on the adoption of innovation connected to the tenure of the manager in their position. A more recent study by Hameed and Counsell(2012) looked at competitive pressure, an external factor, and the CEO characteristics and the adoption of innovation. Hameed and Counsell (2012) stated, "An organization's

strategic decision to adopt or reject an innovation often reflects the personal characteristics of its top managers" (p. 66). There has been a number of studies on the characteristics of the CEO and IT adoption. In their meta analysis of 39 studies of various external and CEO characteristics that could possibly influence the adoption of innovation, they found a positive, but weak, correlation between the CEO's innovativeness, attitude, and IT knowledge, and the adoption of IT.

Awang and Unsworth's (2011) study built on the foundation of a model of implementation effectiveness and they noted that the decsion to adopt an innovation does not mean success. Their focus was on the successful innovation implementation among small and medium sized Australian firms. Their insights were gleaned from a sample of 135 firms. The major significant factors included the financial resources available and top management support as well as implementation climate. They made a distinction between culture and climate. Where culture related to the shared values and assumptions of members of the group, the climate was more of a surface level indicator of the shared perceptions of the organization's policies and practices. A key finding for this studywas that when an organization perceives the innovation to be effective in a number of areas that there is a more positive attitude to future innovation adoption. They also noted that for another type of innovation, another factor was the key predictor to implementation success, and that without a comprehensive model it was difficult for managers to frame their innovation and design an implementation plan. This study sought to generalize types of innovation adoption based on the expected outcomes of the innovation as it relates to the culture of the organization.

Choudhary (2014) reviewed five years of Fast Company World's 50 Most Innovative companies to determine any common factors. It was implied that innovation is needed for companies to survive and thrive in the current economic environment. He did an analysis of

R&D expenditure and number of patents issued among 15 of the companies. Three of the companies on the list had no patents issued during the period. He found no correlation between R&D expenditures as a percentage of total revenue or number of patents granted and innovativeness. His analysis led to reviewing other factors of companies that were on the Fast Company list more than once. He described four traits that would lead to a culture of innovation. The four traits do not neatly fit into one dominant culture, rather he gave four specific examples that lead to a roadmap of increasing innovation in the organization. The shift in culture to "Happy and Motivated Employees" can be seen in a broader context of a cultural change accompanied by other organizational changes described by Smith (2003).

Smith's (2003) study indicated that the culture change should be rooted in business strategy. Instilling a sense of fear or urgency aligns with a competitve market culture and is one of Choudhary's (2014) four traits. It also aligns with Kotter's (2008) need for a sense of urgency to make changes in an organization. Smith(2003) and Choudhary(2014) also covered the need, or the trait, of leadership committed to innovation and committed to the change process.

Hong and Kim's (2002) study of 34 firms found that ERP implementation success depended on the fit between the system and the organization. They discussed the perceived need of the organization to adapt the ERP system to the firm. It was found that the greater the need to modify or adapt the system to the organization, the lower the chances for implementation success. Their study was based on implementing standard ERP software and the need for the organization to change to the standard processes of the package. It was a narrow study, that in this context, would advise the reader to ensure that the package is already a close fit or the firm needs to value flexibility to fit the proposed package. To reframe their recommendation, the critical success factor of an ERP implementation is to implement a package that best fits the

organization. It does not adequately explain why two 'identical' companies in the same industy can have two very different results in implementing the same package, since one would expect that both firms are adopting the same software to the same industry standard processes.

Background on culture. Schein (2010) discussed organizational culture, described it, how he measured it, and the impact of leadership on culture. He reviewed his experiences and observations with past clients and in particular DEC and Ciba-Geigy. He noted culture can change over time with the change in the environment and leadership. He also covered factors in measuring culture and in particular the methods and dimensions to measure culture. His primary measurement method was an ethnographic study of the organization documenting the artifacts, stated beliefs, and values. He encouraged the reader to go below the surface of artifacts and values to uncover the shared basic assumptions that create the patterns of the group. This goes back to Martin's (2009) stance of the individual; however, it is applied to the organization or functional unit within the organization. In general, Schein is opposed to measuring culture by the use of surveys unless it is to measure particular dimensions of culture and some element of performance. Given the current study was to measure specific elements of culture and expected innovation outcomes to determine if there is correlation to implementation success, the use of a survey would be appropriate.

Geert Hofstede conducted his initial survey on national culture in the 1970s with IBM and he published his book "Culture's Consequences" (Hofstede, Hofstede, & Minkov, 2010). From the initial study, he identified four major cultural values. The most recent update to his research (Hofstede, Hofstede, & Minkov, 2010) included six major cultural factors. In addition to the six major national cultural factors, they also covered in chapter 10 how the survey can be adopted for measuring organizational culture. The essence of the survey, and Geert Hofstede's

continuing work, is the measuring of cultural values. This is consistent with Schein (2010), however; they take a different approach. Hofstede's initial survey data included 100,000 IBM employees. With the organization held constant, there was a statistically significant difference in the employee values between countries. Initially, Hofstede found four clusters. With continuing research and collaborating, they have found six distinct cultural value clusters. Hofstede (2010) noted that deciphering culture is like an onion. The surface layer of artifacts and practices can change; however, the cultural values are deeply held and embedded in the individuals. Their work on organizational cultures in chapter 10 is based on additional research work with twenty organizations in Holland and Denmark. Hofstede (2010) notes that organizational culture is different than national culture in that "… If only because the organization's members usually did not grow up in it. On the contrary, they had a certain influence in the decision to join it, are involved in it only during working hours, and will one day leave it" (p.47). The six Hofstede cultural dimensions cited in many studies are as follows:

1. Power Distance
2. Collectivist vs. Individualistic
3. Masculinity vs. Feminine values
4. Uncertainty Avoidance
5. Long Term Orientation
6. Subjective Well Being

Hofstede (2010) observed that organizational cultures consist mainly of practices; however, they also have a values component. They had adopted their survey for twenty companies and mapped out six organizational cultural dimensions. They used a five point scale

to measure people's perceptions of the organization's practices. The six organizational dimensions found in chapter 10 are listed below:

1. Process Oriented versus Results Oriented
2. Employee Oriented versus Job Oriented
3. Parochial versus Professional
4. Open System versus Closed System
5. Loose versus Tight Control
6. Normative versus Pragmatic

Hofstede (2010) noted that cultural dimensions are descriptive and not prescriptive. One should not attribute that one value is better than another. They also allowed that there is no correlation between the various dimensions; however, there can be a cluster of values to describe an organization. Finally, the organization needs to be understood within the national cultural context. Hammerich and Lewis (2013) noted that the national culture is a significant factor in determining the organizational values and in particular the national cultural values will surface when an organization is in crisis.

Cameron and Quinn's (2011) work on the competing values framework wasused to assess organizational culture. It has been validated with over 100,000 responses by individuals in over 10,000 organizations. The framework was based on a series of six questions, a dimension, where the respondent needed to balance their response between four questions within each dimension. Unlike Hofstede, where the responses were independent, each response wasdependent on other responses within the cultural dimension. The six dimensions measured by Cameron and Quinn (2011) are listed below.

1. Dominant Characteristics
2. Organizational Leadership
3. Management of Employees
4. Organizational Glue
5. Strategic emphasis
6. Criteria for success

An example of one question as it relates to the one dimension of Dominant Characteristics ofthe organization is below:

1. The organization is a very personal place. It is like an extended family. People seem to share a lot of themselves.
2. The organization is a dynamic and entrepreneurial place. People are willing to stick their necks out and take risks.
3. The organization is very results oriented. A major concern is with getting the job done. People are very competitive and echievement oriented.
4. The organization is a very controlled and structured place. Formal procedures generally govern what people do.

The respondent was expected to reply with an answer between 0 to 100 against each question and balance the total response of all four questions to 100. The response format reflected that the organization is a combination of all of the above; however, the answer to one question in the group was dependent on the answer to the other questions in that they must add up to 100. The answers to the survey, unlike Hofstede(2010), were not independent.

The six dimensions were then scored and categorized into two key dominant, yet competing, dimensions. The first dimension reflected whether the company's culture was primarily

internally or externally focused. The second dimension reflected whether the company placed its values in stability or flexibility. There were a few versions of diagrams that reflected this model. All of the diagrams reflected the internal versus external focus along the horizontal axis and the flexibility versus stability on the vertical axis. Different diagrams and explanations of the quadrants had slightly different names for the dominant culture in each quadrant. In particular, the label of the cultural orientation was used instead of Cameron and Quinn's (2011) culture type. The clan culture orientation is colloboration; while the Hierarchy cultural orientation is control. Both cultures exhibited an internal focus. The Adhocracy cultural orientation was creative while the Market culture orientation wascompeting. Both of these cultures had an external orientation and what differentiated them was the value placed on stability versus flexibility. The competing values and their quadrants are shown in the following diagram.

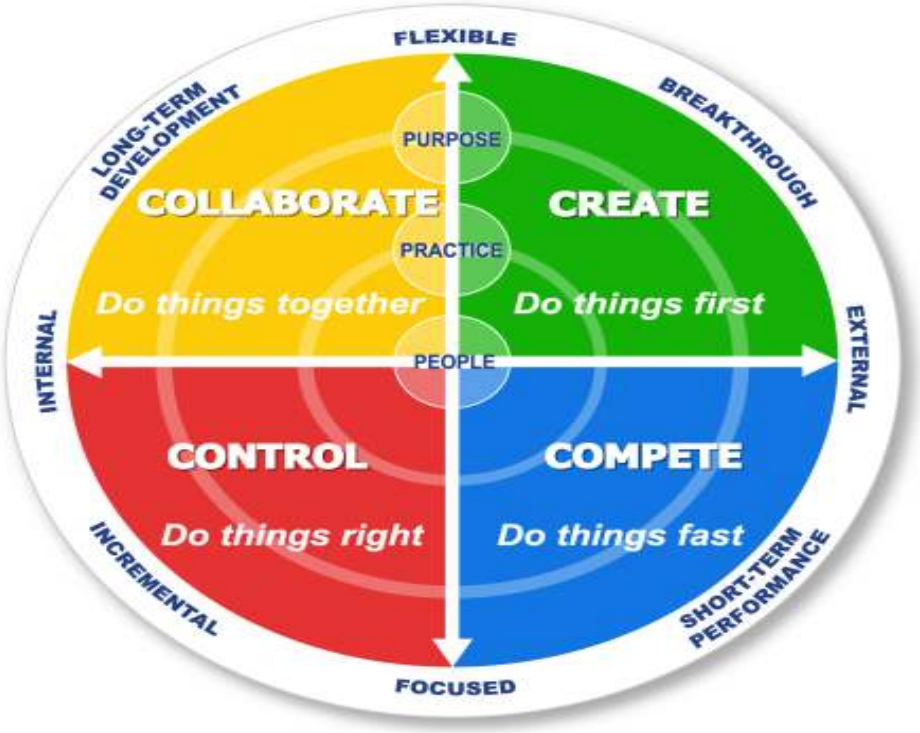

*Figure 2.*Competing Values Framework. Adapted from "The Competing Values Culture Assessment – A tool from the Competing Values Product Line, by K. S. Cameron &R. E. Quinn, 2013.

In their discussion on organizational leadership, Cameron and Quinn (2011) observed that more than eighty percent of the organizations they studied have a dominant cultural type (p. 52). Cameron and Quinn also discussed that when there is a congruence between leadership competencies and a dominant culture then the firm is successful. If one turns the statement around, the leadership is successful as the skills of the leaders reinforce the values of the organization. The researchers also reviewed the implementation of projects within the organization. In particular, they covered TQM projects and noted that quite a few of them, like IT projects, fail. They noted that the TQM failures resulted in only a partial deployment of the project. They did not meet all of the expected outcomes. Another aspect they noted is that TQM project failure is really a failure to integrate cultural change and all key aspects of TQM within the culture. A second review of HR functions within the firm highlighted the need for the HR manager's role to fit the dominant or desired culture. The emphasis on different aspects of the HR manager's role, within different organizational cultures, is used to strengthen or renew the organization.

A more recent study by Ahmadi, Salamzadeh, Daraei and Aakbari (2012) used the Competing Values Framework and five dimensions of strategy implementation. They found a meaningful relationship between the four organizational cultural types and strategy implementation. In particular, they found a higher relationship of implementation between the flexible cultures of clan (Collaborate) and adhocracy (Create).

Yazici (2011) cited the Standish Group studies and another global study on project failures. She posited that organizational cultures that foster communication and collaboration are expected to perform better. She surveyed 76 firms and used the competing values framework as a basis to measure culture. Her model was that organizational culture, moderated by the project

manager's experience, would result in the perceived project performance. Yazici depended on the project manager's perceptions of culture and performance. She also asked the managers to map their current and preferred organization's culture. There was some significance in the difference between the current and preferred culture. While the current dominant cultures were Market (Compete) and Hierarchial (Control), the respondents most common preferred culture was Clan. In her findings, Yazici mentioned that the clan culture is related to more positive organizational outcomes.

Synthesis of Research

Where the innovation comes from does not matter. The issue is whether the organizational cultural soil will be receptive to the seeds of change. Past literature would describe innovations and broad predictors based on national and organizational cultural values that can be used to predict whether implementing change in the organization would be successful. There are enough exceptions to explore a nuance in the nature and expected outcome of the innovation and the organizational cultural soil to determine whether the innovation will take root and florish. The technology acceptance model's performance expectations would map to the expected outcomes of this research. Project management best practices are well documented. There is some correlation between the implementation of best practices and project implementation success; however, even with management best practices there is still failure. This indicates that project management best practices are necessary, but not sufficient, for the successful adoption of an IT innovation. This research tests that the organization's dominant culture is a major intervening factor in the adoption of innovation.

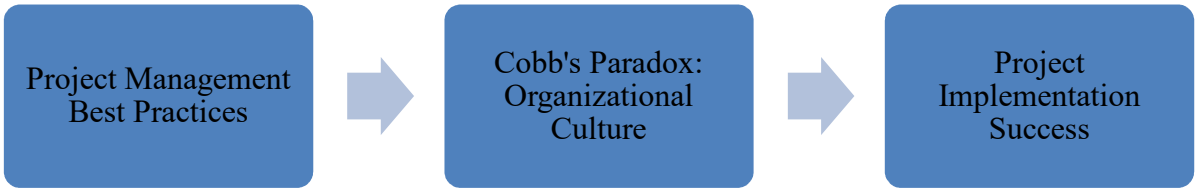

Figure 3. Cobb's Paradox as described through the theoretical design.

Summary

Based on Martin's (2009) idea of integrative thinking, the literature review highlights the literature on the adoption of innovation and organizational culture. Rogers's (2003) work on the diffusion of innovation and Davis's (1989) work on the adoption of technology both started with the adoption of innovation at an individual level. In both cases, their models have been expanded to be used at an organizational level. The Davis (1989) TAM was expanded to UTAUT. Rogers (2003) cited an unknown company president,"Organizations are the ground on which innovations are scattered" (p. 402), as he started to explore the diffusion of innovation in organizations. Cameron and Quinn's (2011) work was the basis of this study to determine the organizational culture which is the soil on which the innovations are scattered. Like the parable of the sower (Matthew 13), the same innovation will have different success depending on the soil on which it is scattered. Management best practices focuses on the process of planting and adopting the innovation. This study used the research on organizational cultural elements and the dominant organizational culture to determine whether there was acorrelation between the type of innovation, based on the expected outcome, and the dominant culture to determine whether the seed of innovation woud grow successfully.

Chapter 3: Methodology

The current business landscape on competition and innovation can be seen with Inc's, Forbes's, and Fast Company's annual most innovative companies' listings, and Harvard Business Review's December 2014 Cover to innovate Faster Cheaper and Smarter. The creation of ideas is very early in the innovation cycle. The research area of interest is in the adoption of innovation. The adoption of innovation is in three parts. The first part is to understand the dominant organizational culture that would consider the adoption of an innovation. Given the organization has decided to implement an innovation, what are the factors that would lead to the successful adoption of an innovation?

The Standish Group came from a project management perspective in their research and promotion of project management best practices. vanEverdingen and Waarts (2003) were grounded in the national cultural aspects that would lead to the successful implementation of projects. The project management perspective is necessary but not sufficient to guarantee implementation success as is borne out in Cobb's Paradox. van Everdingen and Waarts lead in the direction of culture, but national culture is too broad a marker. Narrowing the focus to measuring culture at an organizational level should give a better predictor of success. The combination of both factors, while more complex, would be expected be a better predictor of implementation success.

Moghavvemi, MohdSalleh, Zhao, and Mattila (2012) considered that performance expectations (PE) are considered the strongest predictor of intention. The organization's expected outcome, whether it is lower costs or higher revenue, relates to performance expectancy. While Pasaoglu (2011) found that a TAM key factor to the adoption of innovation was ease of use, he also noted that some aspects would be attributed to organizational culture

could also be a factor for ERP adoption. The combination of expected outcomes and the dominant culture, while more complex, would also be expected to be a better predictor of implementation success.

The research methodology is reviewed in this chapter. It covers the research hypothesis and describes the process and factors that led to the research design.

Purpose of the Study

The purpose of the study is to determine the extent that the dominant organizational culture impacts the successful adoption of innovation by the organization. It tests the impact of culture at the initial stage with the intention to adopt an innovation. It then tests the dominant organizational culture as it impacts project management best practices and the expected outcomes against the successful adoption.

Research Design

The design for this research was quantitative and was based on the foundational work of Cameron and Quinn (2011) and their Competing Values Framework for measuring components of organizational culture. The competing values framework is well proven and has been used in over 100,000 instances. It has also been used as a foundation for earlier peer-reviewed research relating to organizational culture and performance. Permission to use the Competing Values Framework for this research was granted by Dr. Cameron's office (Appendix B).

The Standish Group's result of their longitudinal research, published every two years, (The Standish Group, 2014) was used as a basis for selecting the current project management best practices. They group projects into three results: Successful, Challenged and Failed. The top ten factors of each group was reviewed and consolidated into eleven factors. Where user or management involvement were both project success factors, lack of user and lack of

management involvement were factors of a project's failure. All factors were consolidated into eleven positive language statements.

The successful expected outcome of an innovation would normally be seen as strengthening the values of the organizational culture (Cameron & Quinn, 2011). The expected project outcome labels were generated primarily through the work of Gambatese and Hallowell's (2011) study and their eight benefits or motivators for the adoption of innovation. Those factors were mapped to the four major cultural clusters of the competing values framework to ensure there was internal and external symmetry in the expected outcomes. The focus of the research was to test whether the Dominant Organizational Culture was a major intervening factor in the successful adoption of an innovation.

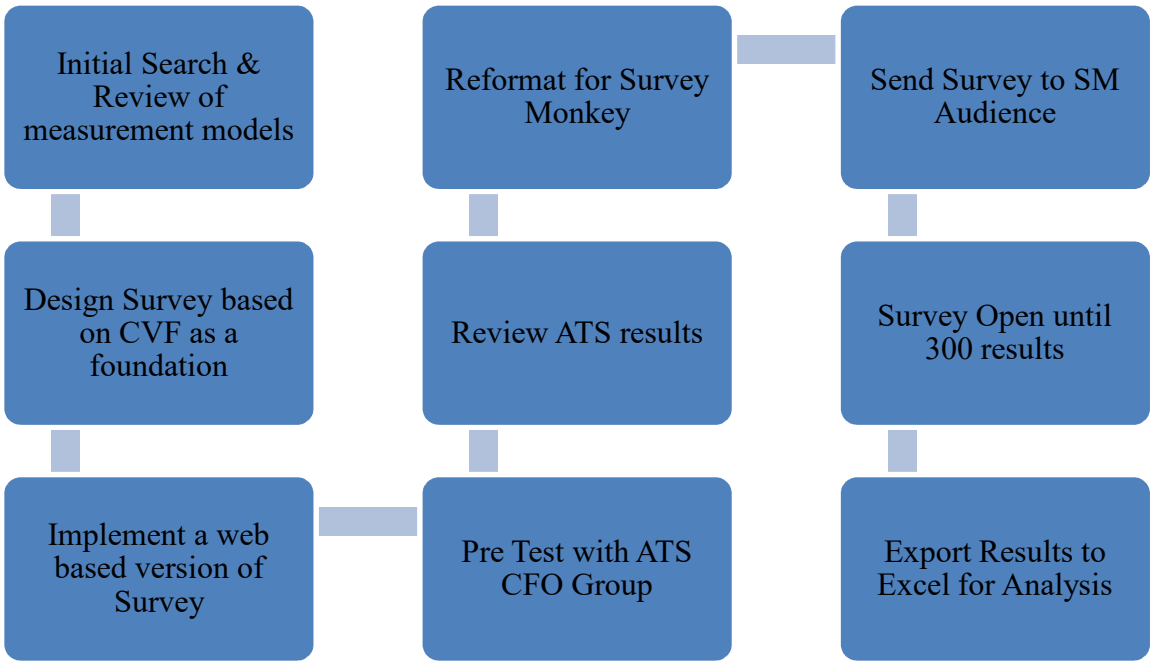

*Figure 4.*Research Design Process. Source: Creswell (2009)

The research design started with drafting a web survey instrument based on the Competing Values Framework, a list of Top Project Management Best Practices, and a list of expected project outcomes. A survey was designed and then a web-based survey was implemented. The survey was initially tested by staff working with the author to ensure that the skip logic worked as expected.

A pretest was conducted with an invitation by ATS on behalf of the author to ATS CFOs on their list serve. There were 200 members on the list serve and 32 members responded with 30 completed surveys. Of the 30 completed surveys, 26 had introduced at least one innovation. There were no other project management best practices added and only one 'other' expected outcome with additional input on the use of a progress completion bar at the bottom of the survey.

The final Survey Monkey instrument is included in Appendix A.

Research Question and Hypotheses

The first research question (R1) was what dominant organizational culture influences the intention to adopt an innovation? From previous literature it is expected that mechanistic or bureaucratic cultures are cultures that tend not to adopt "new ideas." Hypothesis one (H1) was: There is a correlation between the control culture and no or failed innovation adoption. The null hypothesis ($_1H_0$) was that there is no correlation between culture type and whether the firm has introduced an innovation in the last three and half years (since January 1st, 2012).

The second research question (R2) is rooted in Cobb's Paradox: If "we know" the Project Management Best Practices, what is the intervening variable? The thesis was that the dominant organizational culture is a major intervening factor in the adoption of innovation. The second hypothesis (H2) was: There is a correlation between Project Management Best Practices

and the dominant organizational culture, and the successful implementation of an innovation. The null hypothesis is ($_2H_0$) that there is no correlation between Project Management Best Practices and Organizational cultural factors, and the successful implementation of an innovation.

The combination of Rogers's (2003) analogy that the organization's culture is the soil for the adoption of innovation and UTAM's performance expectations (PE) as the major factor for the adoption of technology was the foundation for answering the third research question and developing the third hypothesis. The third hypothesis was (H3): There is a statistically significant relationship between the expected project outcomes and specific dominant cultures as defined using the Competing Values Framework. The third null hypothesis ($_3H_0$) was that there is no correlation between implementation success and organizational culture and expected outcomes.

Population and Sampling Strategy

The desired outcome was to obtain significant results with the generally acceptable confidence interval of 95% and a 5% beta based on the a priori assumption of a normal distribution of the target population of business managers. A sample of five hundred or more members would generally be expected to guarantee the desired statisical results. Sample populations considered included LinkedIn members of the Harvard Business Review and CIO Group, members of the Standish Group Project managers, the Rotman School Alumni, and members of the International Chambers of Commerce. These groups all represented fairly large populations of managers of organizations that would be somewhat representative of the total target. There would have been overlap of members in the various groups. One could be a member of both the CIO and Harvard Business Review groups on LinkedIn. Due to constraints

at the time and a particular interpretation of the regulations (Government of Canada, 2015), it was deemed difficult to obtain a significant sample of managers in Canada by contacting them directly. Survey Monkey Audience was contracted to send out an invitation on behalf of the author to over 500 American Managers selected from their list of over thirty million members.

Research Instrument

The foundation for the survey was the competing values survey developed by Cameron & Quinn (2013). The survey was adopted to use the Survey Monkey survey tool. Additional questions related to organizational demographic profiles and the additional research questions related to the adoption of innovation were added. The final survey tool appears in Appendix A.

Instrument Validation

The basis for the survey and measuring culture was the Competing Values Framework developed and validated through the work of Cameron and Quinn (2011). This instrument has been used in numerous other studies. There have been studies specifically to validate or invalidate the basic framework. An older study, by Kalliath, Bluedorn and Gillespie (1999), used 300 participants to validate and extend the basic structure of the survey and framework. They found that in all but one case, their results support the CVF. They also provided excellent validity and reliability results. Kwon and Walker (2004) tested the instrument between seven of eight Hong Kong institutions and confirmed the validity of the tool in differentiating the organizations. More recently, Yu and Wu (2009) noted that while there are only two dimensions, the model incorporates eight commonly accepted dimensions. They validated the model and then used it in other national cultural situations, in particular in China. Another advantage of the CVF, compared to other tools, was that it was relatively succinct.

The survey instrument was pretested with an invitation by ATS on behalf of the author to ATS CFOs on their list serve. Some basic statistical tests were performed and graphed based on the 30 completed surveys.

Data Collection Procedures

Survey Monkey was contracted to send out an invitation on behalf of the author to over 500 American managers from the Survey Monkey Audience Panel with the expectation of 300 qualified responses. Managers that responded with less than two years experience at their current employer were removed with the consideration that they may not be fully aware of any attempted innovations within their firm over the last three and a half years. This was expected to skew the results slightly in that it would not include any organizations less than two years old.

Data Analyses

The survey was administered using Survey Monkey to obtain the 303 completed survey responses. The data was then exported to an Excel spreadsheet. A preliminary summary of data was performed using the basic Excel functions. Excel formulae were constructed following the instructions of Cameron and Quinn's (2013) assessment tool to convert the responses to the four cultural typologies. An attempt to determine if there is a correlation between cultures and either firm size or age was done with no meaningful results. The original file was used for initial analysis and to provide the summary statistics. The spreadsheet was saved as a csv format. The csv file was then stripped of the organizational demographic data of age and number of employees, and imported into a database and normalized into two files for the majority of the data analysis. There were two data transformations done. While participants could respond on up to four innovation projects based on the final outcome, the outcomes were eventually grouped into the binary dependent variable of success or fail.

The cultural dimensions were converted into one of five categories. If all cultural dimensions were less than 28, then 'middle' was generated as the dominant culture. The first file contained the dominant culture as a category, the expected outcome of the project, and whether it was a success or failure.

The second file included the instance of the dominant culture, the project management factor, and whether it was a success or failure. Of the 303 completed surveys, 199 had indicated that their organization had attempted to introduce an innovation since January 1st, 2012. A respondent could report on up to four innovations introduced to their firm. Each innovation could have one or more expected outcomes and may have included a number of management initiatives. The 199 responses were expanded into two new files with 1,365 records of project status, dominant culture, and expected outcomes and 1,342 records of project status, dominant culture, and project management methods.

The data was imported into Statwing.com, an online statistical service, that was employed to provide the initial statistical results. Excel, with a Microsoft data analysis plug-in and winstat, an additional plug-in, was used for the cross tabulations to confirm the analysis and provide the tables and graphs. Creswell (2009) detailed that the association between groups, in this case the dominant culture, and the dependent variables of introduction of an innovation or implementation success, would be done with a Chi-square analysis. The comparison between two groups would normally be an analysis of variance. What Creswell does not cover is two independent categories in a non-normal distribution to a binary dependent variable. A multiple regression assumes a normal distribution. A Logistic Regression was reviewed by Winston (2014) and can be used to build a predictive model of whether an organization will be successful in adopting an innovation based on the independent variables. Winston indicated that a multiple

linear regression does not always work on a binary dependent variable. The result of Logistic Regression is a series of coeffiecients which can be translated to the odds of success and can then be converted to the probabilityof success or failure based on the various independent factors. The odds are converted from the co-efficients by using the EXP function within Excel and the probability is converted from the odds by: odds/(1+odds). Statwing provided the tools for a logistic regression providing the coefficient, odds, and p values for each factor within the regression. Statwing was also used to iterate on the data analysis and calculate the Akaike information criterion (AIC) values. This was instrumental in determining whether the additional complexity of the model is a better predictive fit.

Summary

A quantitative approach was taken to determine what organizational cultural factors influence the adoption of innovation. A major challenge in the study was in obtaining suitable responses. This was solved by using the services of Survey Monkey to facilitate the invitation of respondents and the collection of data. With 303 completed survey responses by American managers, it was expected there should be sufficient data to provide insight into the organizational cultural factors with sufficient statistical significance.

Chapter 4: Analysis and Presentation of Results

Chapter 4 reviews the data collected. It starts with a summary of the basic data and then proceeds to review the results of the tests as they relate to the three primary research questions. In addition to the original three hypothesis, additional analysis of the data has lead to some additional insights into factors that enhance the adoption of innovation.

Demographic Statistics

The survey was open in 2015 from June 2nd to June 9th, and an invitation was sent to570 Survey Monkey panel members which generated 484 responses for a response rate of 85%. Of the 484 survey responses, 119 responses were screened out as they had been in their position for less than two years. Of the 484 survey responses, 62 people did not complete the survey resulting in a total of 303 completed surveys. Of those surveys, 199 had introduced an innovation in the last three and a half years.

The organizations in the survey range in age from 2-years old to over 200-years old, and the number of employees ranging from one to three firms with one million employees. Due to the screening of managers having to be in their postion for two or more years, early start-up companies would also be excluded (see Table 2).

The age of the organization was determined by subtracting the year founded from 2015. The survey requested the year founded and the resulting age was summarized in table 2 and also shown in the graph in Appendix C. A complete set of tables and charts of the organizational characteristics such as age, number of employees, and organizational dominant culture are included in Appendix C.

A total of 446 innovation results were reported with 152 that exceeded the expected outcomes and 185 that met the expected outcomes. Of the 446 innovation results reported, 109

innovation initiatives failed to meet the expected outcomes, including 33 that were cancelled before completion and 76 which, on completion, did not meet expectations (see Figure 5).

Table 2

Organizational Age Distribution

Age (years)	Count
1 to 24	112
25 to 49	98
50 to 74	37
75 to 99	14
100 to 124	22
125 to 149	8
150 to 174	4
175 to 199	2
200+	6
Total	303

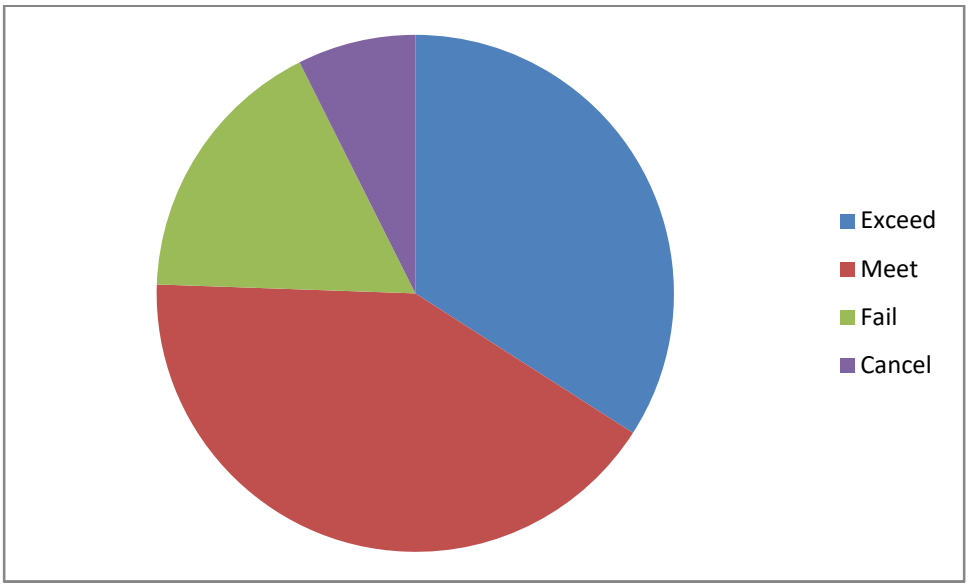

Figure 5. Distribution of Project Status

For further analysis, the meet and exceed expectations were grouped as successful, and the cancelled before completion and failed to meet expectations were grouped as failed.

Organizational cultural background. The competing values framework was used to determine the organizational culture. The framework summarized the values into dominant typologies which are the result of four numbers, one for each quadrant. This reflected that an organization has a mix of values. For the purposes of the research, each firm was assigned one dominant culture which was based on the highest ranking quadrant. If no quadrant exceeded a value of 28 then 'middle' culture was assessed.

The organization's culture was then assigned to one of five categories, either one of the four CVF cultures or 'middle'. Table 3 gives the total distribution of companies that completed the survey by culture.

Table 3

Distribution of Organizations by Culture

	Clan	Compete	Control	Create	Middle	Total
Count	108	52	46	28	69	303
Percent	35.64	17.16	15.18	9.24	22.77	100.00

Details of Analysis and Results

This section reviews the statistical results of the null hypothesis for each research question.

(H1): To confirm the earlier theories of mechanistic or bureaucratic cultures, there is negative correlation between uncertainty avoidance and the adoption of innovation. The test is if there is a correlation between the control culture, and no or failed innovation adoption. The null hypothesis ($_1H_0$) is that there is no correlation between culture type and whether the firm has introduced an innovation in the last three and half years (since January 1st, 2012).

The statisticial test was to determine if there was any correlation between culture and whether an innovation was introduced into the organization. All 303 completed surveys were

used and the initial test was conducted using the Statwing.com service. An initial test against all four calculated culture typology numerical values as the independent variables and the introduction of innovation (yes/no) as the dependent variable was conducted. The initial analysis came back that there was a relationship between the cultural variables. As the clan value increased, control value would be expected to decrease so the values are not independent. This required revising the data model to use the five categories of culture (clan, compete, control, create and middle), and to perform a logisitic regression of culture (category) and introduction of innovation (yes/no). The statistics were rerun and the regression determined that there was a statistical correlation between culture and the introduction of an innovation. The strongest statistical result was for the clan culture (positive) with a p value of 0.000174 and compete culture (negative) with a p value of 0.0431. The control culture had a p value of 0.055 which is slightly over the 0.05 cut-off for a strong statistical significance.

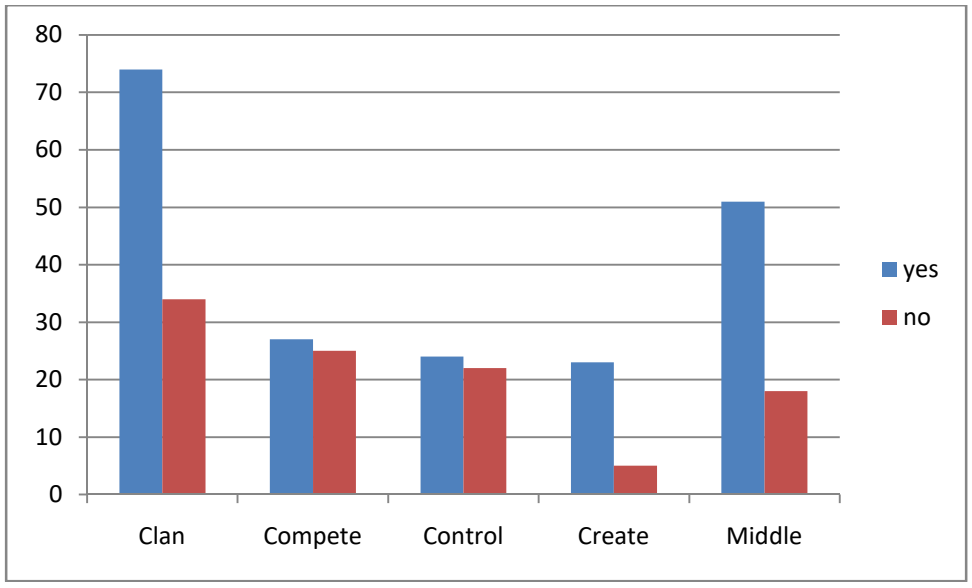

Figure 6. Introduction of Innovation by Culture

Confining the results to the four competing values cultures, one can observe that the two flexible cultures of clan and create would have a greater likelihood of introducing an innovation.

A complete set of statictical tests based on a cross tabulation between culture and whether an innovation was introduced is found in Appendix D. There is statistical significance in the control and compete cultures, where stability is valued, they are not as likely to introduce an innovation.

The second research question was rooted in Cobb's Paradox: If "we know" the project management best practices, what is the intervening variable that still causes projects to fail? The thesis was that the dominant organizational culture is the major intervening factor in the adoption of innovation. The alternative hypothesis (H2) was: There is a correlation between Project Management Best Practices and the dominant organizational culture, and the successful implementation of an innovation.

The null hypothesis ($_2H_0$) was that there are no correlations between Project Management Best Practices, Organizational Cultural Factors, and the successful implementation of an innovation. The focus of the research was to demonstrate that there are additional factors to the successful implementation of innovation.

Testing for project management best practices and success alone led to statistical significance using a Chi Square test. This was consistent with the Standish Group and other organizations that focused on project management best practices. The logisitic regression was employed with one category and was also used to test whether adding the intervening factor of the organization's dominant culture as a category would be statistically significant. The AICc for a one-factor versus a two-factor model decreased slightly from 1444 to 1395 indicating the trade off for introducing another factor is worth the complexity. McFadden's pseudo R-squared went from 0.0198 to 0.0589 indicating a better model fit. This would indicate that the null hypothesis ($_2H_0$) that there is no correlation between Project Management Best Practices,

organizational cultural factors, and the successful implementation of innovation was false. Results of the logistic regression can be found in Appendix E, Table 12.

The Statwing service was employed to provide a logistic regression of project management practices and project success. Six of the factors were clearly signficant with p values of 0.05 or less. A full table of the regression values and coefficients are shown in Table E5 and also graphed in Appendix E.

A secondary analysis and test was made to determine if the number of management best practices employed made a statistical difference for implementation success. The null hypothesis is that the number of management best practices do not make a difference to innovation implementation success. The data was reformatted to report the implementation success and the number of management best practices employed for the project. A logistic regression was used to determine that at 95% confidence interval there was no statistical significance. However, at an 85% confidence, interval results were significant: When the number of management best practices was increased by one, then the likelihood of project failure would decrease. The AICc of 498, from the same data set, would indicate that as the number of project management best practices was increased, so was the likelihood of project success. The Statwing results and descriptive statistics for the additional test are found in Appendix F.

(H3):There is a statistically significant relationship between the expected project outcomes and specific dominant cultures using the Competing Values Framework. The null hypothesis ($_3H_0$) was that there is no correlation between implementation success and the two independent factors of organizational culture and expected innovation outcomes. Statwing was used to provide a logisitic regression of the two independent categories of organizational culture and expected outcomes versus success. It was found that expected outcomes was not a

statistically significant factor of the two factor regression. The model was reduced to one factor of organizational culture, and there was a significant result. With a 95% confidence interval, the hypothesis of expected outcomes and organizational culture as a basis for the successful adoption of innovation was not supported; however, the dominant organizational culture was a significant factor. The expected outcomes was not a significant factor of organizational success until the regression was rerun at an 80% confidence interval. The statistical results can be found in Appendix G.

The model was reformated without the expected outcomes. Only the organizational culture and the innovation implementation success were selected, and a logistic regression was run. There was statistical significance at 95% that organizational culture, regardless of expected outcomes or project management best practices, is a determinant in the successful implementation of innovation. A summary of the statistical results of the dominant culture and implementation success can be found in Appendix H.

A final analysis of the two largest cultural groups of clan and middle was run to determine if expected outcomes had a bearing on successful implementation. The clan results were extracted and a regression was run at 95% with no significance as a result. The middle results were also extracted and a regression was run at 95% and at 80% confidence intervals. The results were statistically significant at 80%. A summary of the statistical results based on the expected outcomes of the middle culture can be found in Appendix I. It was determined that if the culture is not known, or there was no dominant culture, then innovations that were expected to yield lower costs or higher revenue had a much better probability of a successful implementation than other innovation outcomes; this was held with p values less than 0.05. Two additional expected outcomes also would lead to significantly greater success; however, their p

values were greater than 0.05; those expected outcomes were introduced new capabilities and improved teamwork.

Summary

The basis for the research was the Competing Values Framework to measure organizational culture. It was expanded to include questions about the organization, innovation initiatives, and expected innovation outcomes. The statistical results had a strong rejection of the null hypotheses for the first two questions. The statisical results of the survey indicate that the Compete Culture is less open to the introduction of innovation. The results also indicate that the implementation of management best practices has an impact on the successful implementation of an innovation. It also indicates, to some extent, that the more best practices that are implemented, the greater the probability of success. The rejection of the third hypothesis would, at best, give mixed results. It indicated that there is a weak correlation between the combined expected outcomes and organizational factors, and the successful implementation of an innovation. The results are more significant in specific organizational cultural contexts. Finally, the implementation culture is the most significant determinant between culture and expected outcomes in the implementation of an innovation; however, in the case of a middle culture, or where the culture is not known, then the expected outcome of the innovation could be a factor in the success of implementing an innovation.

Chapter 5: Conclusions and Recommendations

The survey results confirm what some experienced project managers and senior management intuitively knew. The results, understood in the correct context, can be instructive for those in industry attempting to introduce an innovation to potential customers as well as to project managers and organizational leadership. The introduction or diffusion of innovation goes beyond IT. An innovation can be a change in pricing from selling by the slice instead of selling by the pound, or it could be a new production technology. This chapter will review the survey findings in a practical context and consider some avenues for additional research.

Summary of the Results

The survey resulted in 303 completed survey responses. Of the 303 completed surveys, 199 had an innovation introduced to their firm within the last three and a half years. Of the firms that introduced an innovation, results were reported on 446 innovations. There was statistical significance in the use of project management best practices. Project management improves the odds of a successful implementation; however, it does not guarantee it. The organizational dominant culture has a significant impact on the successful implementation of an innovation. Secondary findings, outside of the original research questions, determined that implementing more of the project management best practices does improve the probability of success. It was also determined that if there is no dominant culture, then certain expected outcomes may have an impact on the successful implementation of an innovation.

Discussion of the Results

(H1): To confirm the earlier theories of mechanistic or bureaucratic cultures, there is negative correlation between uncertianty avoidance and the adoption of innovation. The survey results indicate that the null hypothesis that there is no difference in culture and the probability

that an innovation will be introduced to an orgnization is false. In particular, cultures with a strong need for stability, as outlined in Cameron and Quinn (2011), have a lower incidence of introducing innovation over the three and a half year period that was surveyed. The need for stability also relates to Hofstede's uncertianty avoidance.

(H2): To confirm Cobb's Paradox and move beyond the Standish Group's best management practices, there is no correlation between the top ten best practices and project success or failure. It may be necessary, however, it is not sufficient for the successful adoption of an IT innovation. The survey results indicate that the null hypothesis, that there is no correlation between best practices and project success, is false. Secondary analysis of the data also indicates that there is a positive relationship between the number of best practices employed and project success. Finally, a two factor regression of culture and best management practices does give a better predictive model. The AIC moves from 1444 for the one-factor model to 1395 for the two-factor model. Accounting for organizational culture, even while more complex, does result in a better statistical fit. Cobb's Paradox could be partially explained by the mitigating factors of organizational culture. The lower confidence intervals and R-Factor indicate that this is not a complete explanation of innovation implementation success.

(H3): Understanding that organizational culture is the soil for the successful growth and adoption of innovation, there is a statistically significant relationship between the expected project outcomes and specific dominant cultures as defined using the Competing Values Framework. The survey results were inconclusive on the two-factor model of culture and expected outcomes. Further data analysis indicates that organization culture alone is a better predictor of innovation implementation success rather than the interplay between culture and expected outcomes. Further analysis indicates that where culture can not be determined, then the

expected outcomes can be used to predict, to some level of confidence, the probability of implementation success.

Implications for sales and marketing. One of the top ten causes for failure of IT projects, as identified by the Standish Group (1995), was the introduction of new technology. The first thing to determine is whether the sales offer is for a new or emerging technology. The expectation would be that early adopters are a special case of client for a new or emerging solution, then there is the chasm to the mainstream as identified by Moore (2002). In the mainstream adoption, clients are looking for an innovation to solve a particular problem (Christensen & Raynor, 2003). The expected outcome of adopting the solution is a critical factor for clients in choosing to implement the innovation. The innovation is going to change the practices of the recipient organization and there must be a perceived benefit to going through the pain of change. The research results indicate that a control or compete culture is less likely to even consider an innovation. Both the control and compete cultures value stability and are less receptive to change. If the culture of the organization is not known, then the research results of the expected outcomes would indicate that solutions with the promise of costs savings or increased revenue have a greater likelihood of success than other expected outcomes.

If the prospect encountered is a control culture with a specific cost reduction need, once the decision has been made to adopt the innovation, with management support, it should have 'reasonable' odds of success. If the prospect encountered has been identified as clan, also known as a colloborative, culture, these are the best odds for the decision to implement and for implementation success, regardless of the expected outcome. If the prospect encountered is a creative culture, the culture is open to new ideas; however, the odds of success, everything else being equal, is lower in this culture than any of the other organizational cultures. If the prospect

has a compete or market culture, the odds of introducing the innovation are as good as the control culture and probability of implementation success is better than the creative culture.

Implications for project management. When the organization has decided to adopt an innovation, if the project is disruptive enough or large enough, it will hire or appoint a project manager to shepherd the adoption process to a successful completion. As a project manager, apart from the normal reporting and administrative functions, one needs to assess the scope and nature of the project. From their career perspective, the manager should assess the liklihood of success. That would begin with an assessment of the culture of the organization. Is the culture receptive to change? The control and compete cultures are less receptive to change. If the culture is indeterminant, then one needs to consider the expected outcomes of the project. Projects with the measureable promise of improved costs or revenue have the best traction. Projects that promise improved teamwork or new capabilities to the organization also have reasonable odds for success. Finally, the research results indicate that management must endorse the project; otherwise, for the most part it will fail. The more of the project management best practices, as outlined in the research results, that are used the probability of success increases; however, it does not guarantee success. From the results, it does not matter whether there is a kick-off meeting; however, management support with realistic expectations backed by adequate human and financial resources has the most significant positive impact on the successful adoption of innovation in the organization. The organizational cultural soil has to be receptive to the innovation otherwise it will die. One can introduce a sense of urgency (Kotter, 2008) and must be cognizant of why change efforts fail. Kotter (1995) initially identified that one reason the adoption of an innovation fails is when it is not anchored in the organization's culture. As a

project manager one needs to ensure that the innovation has a business and organizational cultural alignment to ensure continued success.

Implications for organizational leadership. The leadership should be aware of the culture of their organization. They may go through a formal assessment and determine that there may be changes in the underlying values that need to occur for the sustained health of the organization. They may go through a review and chart the current values and where they would like to take the organization using a methodology outlined by Cameron and Quinn(2011). One would also need to understand what it means for the organization to be more innovative and whether that is a value that the organization needs to adopt. It maybe that the organization does not have to be more innovative in the sense of generating break-through ideas, but more opportunistic in adopting ideas from other venues for their context.

In seeking to adopt an innovation for their context, leadership understands the organizational culture consists of shared values and perspectives. All members, and an entire industry, can agree on the 'facts'; however, the organizational culture preserves the shared values and perspective – it determines how the organization views and addresses the 'facts'. Introducing an innovation is introducing a change in process, policy, or procedures and may include a need to reassess the organization's values.

Kotter expanded his 1995 article to a book (Kotter, 2012) and gave the example where one can introduce an innovation with the positive expected outcomes; however, as time goes by, the cultural values creep back in. The example Kotter (2012, p. 153) gave was of a divisional general manager that had accomplished significant change; however, after he retired the organizational cultural values slowly undid the changes. This was a result of the initial

implementation not being grounded in the culture. Kotter outlined eight steps in change management to help senior management lead an organization through change management.

Management needs to understand the current culture of the organization. If the organization values stability, the likelihood of introducing an innovation, much less it's successful implementation, could be low. Management will need to cultivate the organizational cultural soil to ensure that it is suitable to plant the seed of innovation. Kotter (2008) and Kotter(2012) have some excellent suggestions for preparing the organization so that it understands the need for change.

It may be that the introduction of innovation is part of the cultural reshaping of the organization and that the expected outcome of the innovation is helping the organization move towards a new set of values and perspectives. Knowing the culture of the organization and where they want to take it, leadership should ensure that the expected outcomes of the innovation match the target values of the organization. Some expected outcomes such as improved costs and increased revenue cut through most organizational cultures; however, an innovation with an expected outcome of improved teamwork in the organizational soil that values individual effort and rewards individual achievement would be toxic for such a collaborative effort. While the survey results indicate that culture trumps management best practices; organizational leadership should ensure that, whatever the innovation, it should have senior management involvement, realistic expectations, and be given sufficient financial and human resources to improve the odds of implementation success.

Cobb's Paradox is that for all of the project management best practices there are still factors that impact the organizational implementation context beyond the rational measurements of project management. Perhaps project management best practices are like Plato's shadows in

the cave. While the prisoners are shackled to project management best practices, they see the shadows of the objects as the whole truth. Understanding organizational culture and expected project outcomes goes in some part to exposing the project management prisoners to the light.

Recommendations for Further Research

One of the challenges in this research was in obtaining sufficient responses to get statistical significance in all areas. Since the control and creative organizational dominant cultures are not as well respresented as the clan culture, the analysis loses statistical significance when attempting to make a correlation between some expected outcomes and project management best practices. The cross tabulations start to break down into low results. Given there is some statisical significance at 80% and 85%, further research with a larger sample set may yield more statisically relevant results in the areas of expected outcomes for specific dominant organizational cultures.

The survey was conducted in the 9United States to ensure that national culture was held constant and organizational culture would vary. One would suspect that repeating the results in another national culture will give additional results to contrast with the current findings.

The cultural survey was completed by one individual for each organization. In the case of the ATS pretest, CFOs completed the survey. They have a particular perspective of their organization's culture that may not be shared by others in the organization. A research project where ten or more members of the organization complete the survey may give a richer perspective on the culture, expected outcomes, and the ultimate implementation success of the innovation.

Case studies on specific organizational cultures and specific implementation projects should give additional insight into how senior leadership, along with project management, can

harness specific organizational cultural factors to ensure the successful implementation of innovation.

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Appendices

Appendix A

Survey Instrument

I am Doctoral Student at SMC. For my dissertation I am conducting a quantitative study on Organizational Culture Factors and the adoption of Innovation. The purpose of the study is to determine the correlation between organizational culture and the successful implementation of specific innovations.

Your participation in this survey is voluntary and during the course of the survey you may refuse or withdraw at any time without jeopardy. All data gathered from participants that withdraw will be disregardedandnotstored.Therearenoanticipatedrisksforparticipatinginthisstudy.

The survey details are confidential. If you have any questions about the survey or require further information about this study you may contact me, Tom Kobelt, at tom@kdi.ca or 1-800-661-1755 ext. 210.

Your information will be of practical use as it relates directly to organizations and innovation. Please take 5 to 7 minutes to complete the following survey.

Thank you.

By clicking 'Next' you agree to continue to the next page you are indicating that you consent to participate in this study.

You may print a copy of this consent form for your own records.

How many years have you been employed in your organization

Less than one year

One to two years

Overtwo years

What year was your organization established? (1800-2014)

How many employees does your organization employ?

The next six questions ask you to identify the way you experience your organization right now. In the survey, "the organization" refers to the organization managed by your boss (or the organization in which you manage).

Please rate each of the statements by dividing 100 points between alternatives A, B, C, and D depending on how similar the description is to your firm. (100 would indicate very similar and 0 would indicate not at all similar). The total points for each question must equal 100. The assessment uses this method to better demonstrate how trade-offs always exist in organizations. You may divide the 100 points in any way among the four alternatives in each question. Some alternatives may get zero points.

Dominant Characteristics (Divide 100 points between A, B, C and D)

The organization is a very personal place. It is like an extended family. People seem to share a lot of themselves.

The organization is very dynamic and entrepreneurial place. People are willing to stick their necks out and take risks.

The organization is very results oriented. A major concern is with getting the job done. People are very competitive and achievement oriented.

The organization is a very controlled and structured place. Formal procedures generally govern what people do.

Organizational Leadership (Divide 100 points between A, B, C and D).

The leadership in the organization is generally considered to exemplify mentoring, facilitating or nurturing.

The leadership in the organization is generally considered to exemplify entrepreneurship, innovating and risk taking.

The leadership in the organization is generally considered to exemplify an aggressive, results-oriented, no-nonsense focus.

The leadership in the organization is generally considered to exemplify coordinating, organizing, or smooth-running efficiency.

Please rate each of the statements by dividing 100 points between alternatives A, B, C, and D depending on how similar the description is to your firm. (100 would indicate very similar and 0 would indicate not at all similar). The total points for each question must equal 100. The assessment uses this method to better demonstrate how trade-offs always exist in organizations. You may divide the 100 points in any way among the four alternatives in each question. Some alternatives may get zero points.

Management of Employees (Divide 100 points between A,B,C and D).

The management style in the organization is characterized by teamwork, consensus and participation.

The management style in the organization is characterized by individual risk-taking, innovation, freedom and uniqueness

The management style in the organization is characterized by hard-driving competitiveness, high demands, and achievement.

The management style in the organization is characterized by security of employment, conformity, predictability, and stability in relationships.

Organizational Glue (Divide 100 points between A, B, C and D).

The glue that holds the organization together is loyalty, and mutual trust. Commitment to this organization runs high.

The glue that holds the organization together is commitment to innovation and development. There is an emphasis on being on the cutting edge.

The glue that holds the organization together is the emphasis on achievement and goal accomplishment. Aggressiveness and winning are common themes.

The glue that holds the organization together is formal rules and policies. Maintaining a smooth running organization is important.

Please rate each of the statements by dividing 100 points between alternatives A, B, C, and D depending on how similar the description is to your firm. (100 would indicate very similar and 0 would indicate not at all similar). The total points for each question must equal 100. The assessment uses this method to better demonstrate how trade-offs always exist in organizations. You may divide the 100 points in any way among the four alternatives in each question. Some alternatives may get zero points.

Criteria of Success (Divide 100 points between A, B, C and D).

The organization defines success on the basis of the development of human resources, teamwork, employee commitment, and concern for people.
The organization defines success on the basis of having the most unique or newest products. It is a product leader or innovator.
The organization defines success on the basis of winning in the marketplace and outpacing the competition. Competitive market leadership is key.
The organization defines success on the basis of efficiency. Dependable delivery, smooth scheduling, and low cost production are critical.

Strategic Emphasis (Divide 100 points between A, B, C and D)

The organization emphasizes acquiring new resources and creating new challenges. Trying new things and prospecting for opportunities are valued.

The organization emphasizes competitive actions and achievement. Hitting stretch targets and winning in the marketplace are dominant.

The organization emphasizes permanence and stability. Efficiency, control and smooth operations are important.

Since January 1st, 2012 (In the last 3 1/2 years) has your firm introduced any innovations?

Yes

No

Of your firm's recent innovations, did any meet or exceed ALL expected outcomes?

Yes

No

These two questions reflect on one representative innovation project for each category. If you had three successful innovations think of one successful innovation and the expected outcomes and implementation factors of that innovation.

Of the innovation project that met or exceed the expected outcomes, what were the expected outcomes?

Improved Costs

Improved Revenues

Improved Internal Communications

Improved Teamwork

Improved Internal Control

Improved External communications

Introduced New Capabilities

Introduced New Offerings

Introduced New Delivery of Current Offerings

Introduced New Pricing of Current Offerings

Improved Quality of Current Offerings

Other Expected Outcome

What Project Management Factors contributed to meeting or exceeding all expected outcomes?

Kick off meeting

Project Charter established

Expected outcomes clearly communicated to all participants

Project Champion appointed

Adequate financial resources given

Adequate 'slack time' given

Adequate human resources given

Sufficient End User involvement

Introduced New Technology

Management Support

Realistic Expectations

Other Project management considerations

Of your firm's recent innovations, did any meet MOST of the expected outcomes?

Yes

No

These two questions reflect on one representative innovation project for each category. If you had three innovations that met most expectations think of one innovation and the expected outcomes and implementation factors of that innovation.

Of the innovation project that met most of the expected outcomes, what were all the expected outcomes?

Improved Costs Improved Revenues

Improved Internal Communications

Improved Teamwork

Improved Internal Control

Improved External communications

Introduced New Capabilities

Introduced New Offerings

Introduced New Delivery of Current Offerings

Introduced New Pricing of Current Offerings

Improved Quality of Current Offerings

Other Expected Outcome

What Project Management Factors were used?

Kick off meeting

Project Charter established

Expected outcomes clearly communicated to all participants

Project Champion appointed

Adequate financial resources given

Adequate 'slack time' given

Adequate human resources given

Sufficient End User involvement

Introduced New Technology

Management Support

Realistic Expectations

Other Project management considerations

Of your firm's recent innovations, did any <u>NOT</u>meet expected outcomes?

Yes

No

These two questions reflect on one representative innovation project for each category. If you had three innovations that <u>did not meet</u> expectations think of one innovation and the expected outcomes and implementation factors of that innovation.

Of the innovation project that <u>did not meet</u> the expected outcomes, what were all the expected outcomes?

Improved Costs Improved Revenues

Improved Internal Communications

Improved Teamwork

Improved Internal Control

Improved External communications

Introduced New Capabilities

Introduced New Offerings

Introduced New Delivery of Current Offerings

Introduced New Pricing of Current Offerings

Improved Quality of Current Offerings

Other Expected Outcome

What Project Management Factors were used?

Kick off meeting

Project Charter established

Expected outcomes clearly communicated to all participants

Project Champion appointed

Adequate financial resources given

Adequate 'slack time' given

Adequate human resources given

Sufficient End User involvement

Introduced New Technology

Management Support

Realistic Expectations

Other Project management considerations

Of your firm's recent innovations, were any CANCELLED before completion?

Yes

No

These two questions reflect on one representative innovation project for each category. If you had three innovation projects that were cancelled before completion pick one innovation and the expected outcomes and implementation factors of that innovation.

Of the innovation project that was cancelled before completion, what were all the expected outcomes?

Improved Costs Improved Revenues

Improved Internal Communications

Improved Teamwork

Improved Internal Control

Improved External communications

Introduced New Capabilities

Introduced New Offerings

Introduced New Delivery of Current Offerings

Introduced New Pricing of Current Offerings

Improved Quality of Current Offerings

Other Expected Outcome

What Project Management Factors were used?

Kick off meeting

Project Charter established

Expected outcomes clearly communicated to all participants

Project Champion appointed

Adequate financial resources given

Adequate 'slack time' given

Adequate human resources given

Sufficient End User involvement

Introduced New Technology Management Support

Realistic Expectations

Other Project management considerations

Thank you for participating in the survey.

Please CLICK DONE to submit your responses.

Appendix B

Permission

Dear Tom,

Thank you for your inquiry regarding the Organizational Culture Assessment Instrument (OCAI). Kim Cameron copyrighted the OCAI in the 1980s, but because it is published in the Diagnosing and Changing Organizational Culture book, it is also copyrighted by Jossey Bass.

The instrument may be used free of charge for research or student purposes, but a licensing fee is charged when the instrument is used by a company or by consulting firms to generate revenues. As a graduate student, you may use it free of charge. Professor Cameron would appreciate it if you would share your results with him when you finish your study.

We do have a local company (BDS, Behavioral Data Services, 734-663-2990, Sherry.Slade@b-d-s.com) which can distribute the instrument on-line, tabulate scores, and produce feedback reports for a fee. These reports include comparison data from approximately 10,000 organizations--representing many industries and sectors, five continents, and approximately 100,000 individuals.

I hope this explanation is helpful. Congratulations on your program, and I wish you well on your project.

Best wishes,

Meredith Mecham Smith

Assistant to Kim Cameron

Appendix C

Organizational Characteristics

Table C1

Age of Organizations

Age (years)	Count
1 to 24	112
25 to 49	98
50 to 74	37
75 to 99	14
100 to 124	22
125 to 149	8
150 to 174	4
175 to 199	2
200+	6
Total	**303**

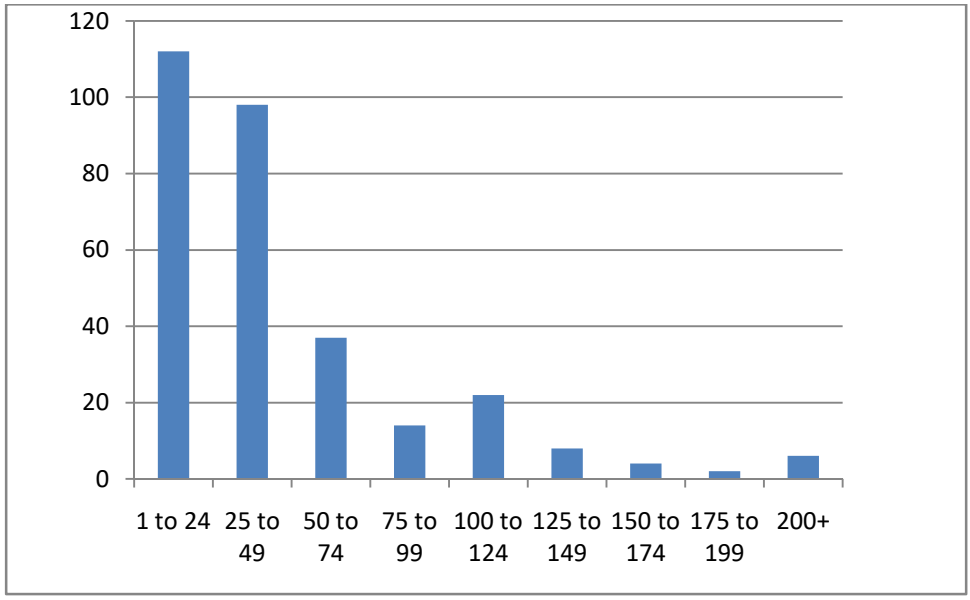

Figure C1. Distribution of Age of Organizations

Table C2

Organizational Size Distribution

Employees	Count
1 to 10	27
11 to 100	71
101 to 1000	105
1001 to 10,000	67
10,001 to 100,000	25
100,001 to 1,000,000	8
Total	**303**

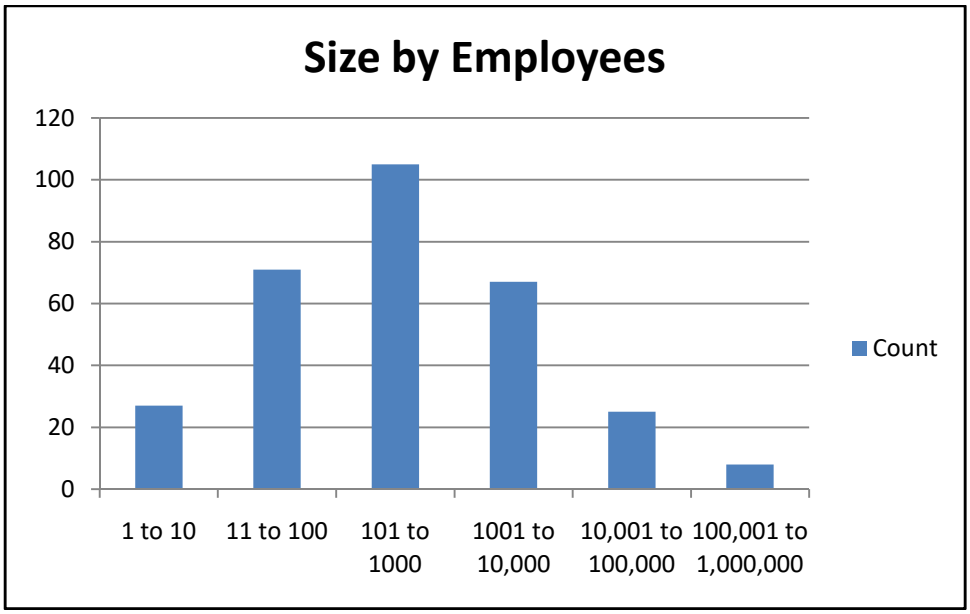

*Figure C2.*Organizational Size Distribution

Appendix D

Hypothesis 1: Culture and the introduction of innovation

Table D1

Organizational Distribution by Culture

Culture	Count	Percent of Data	Confidence Interval
Clan	108	35.6%	30.5% to 41.2%
Compete	52	17.2%	13.3% to 21.8%
Control	46	15.2%	11.6% to 19.7%
Create	28	9.2%	6.5% to 13.0%
Middle	69	22.8%	18.4% to 27.8%
Total	**303**		

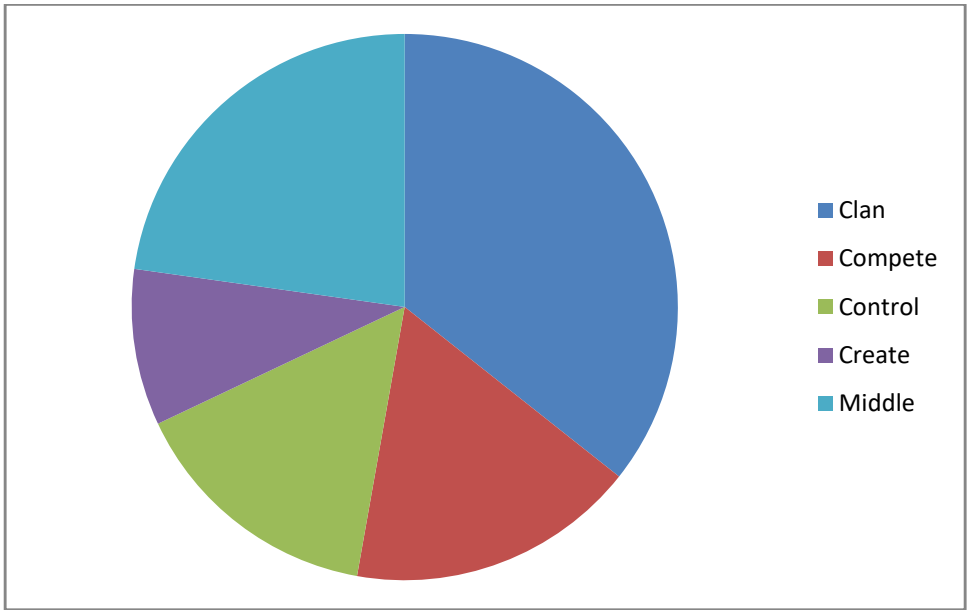

Figure D1.Organization Distribution by Culture

Table D2

Logistic Regression of Organizational Culture and Introduce an Innovation

Sample Size	303
Confidence	95.00%
Method	Logistic Regression
Model Fit (AICc)	386
McFadden's R-Squared	0.0360

Table D3

Logistic Regression of Organizational Culture when an innovation was introduced and not introduced

Regression parameters summary for No			an innovation was not introduced		
Parameters	Coefficients	Odds	P-value	Probability	
Intercept[Clan]	-0.7777	0.4595	**0.0002**		0.3148
CULTUR[Middle]	-0.2637	0.7682	0.4428		0.4344
CULTUR[Compete]	0.7007	2.0153	**0.0431**		0.6684
CULTUR[Control]	0.6907	1.9951	0.0555		0.6661
CULTUR[Create]	-0.7484	0.4731	0.1620		0.3212

Regression parameters summary for Yes			an innovation was introduced		
Parameters	Coefficients	Odds	P-value	Probability	
Intercept[Clan]	0.7777	2.1765	**0.0002**		0.6852
CULTUR[Middle]	0.2637	1.3018	0.4428		0.5656
CULTUR[Compete]	-0.7007	0.4962	**0.0431**		0.3316
CULTUR[Control]	-0.6907	0.5012	0.0555		0.3339
CULTUR[Create]	0.7484	2.1135	0.1620		0.6788

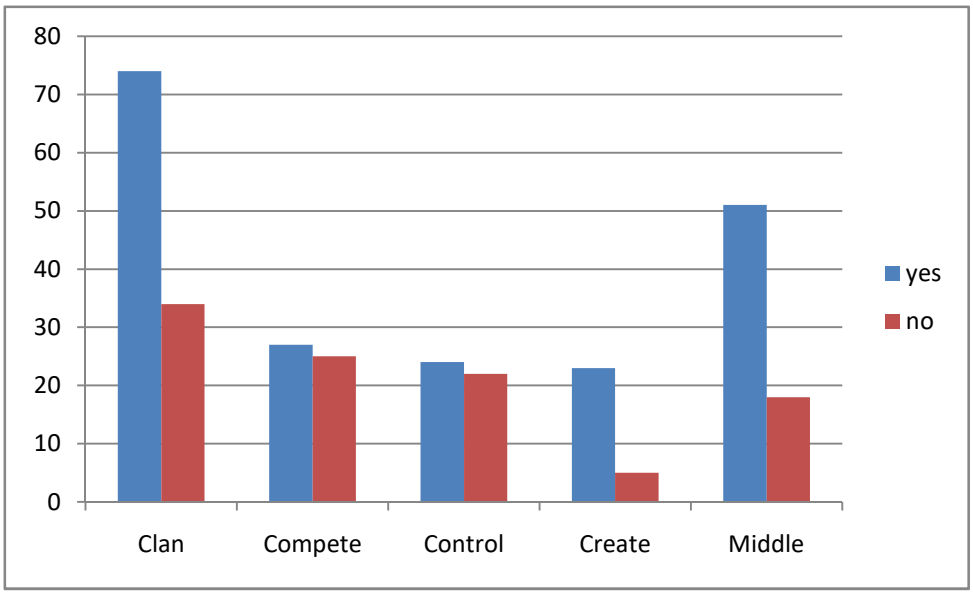

*Figure D2.*Organizational Culture and Introduced an Innovation

Appendix E

Hypothesis 2: Management Best Practices and the successful implementation of innovation

Table E1

Distribution of Management Best Practices

Categorical summary	Count	Percent of Data	Confidence Interval
Adequate 'slack time' given	84	6.2%	5.0% to 7.6%
Adequate financial resources given	131	9.6%	8.1% to 11.3%
Adequate human resources given	119	8.7%	7.3% to 10.3%
Expected outcomes clearly communicated	167	12.2%	10.6% to 14.1%
Introduced New Technology	174	12.7%	11.1% to 14.6%
Kick off meeting	141	10.3%	8.8% to 12.1%
Management Support	151	11.1%	9.5% to 12.8%
Project Champion appointed	104	7.6%	6.3% to 9.1%
Project Charter established	83	6.1%	4.9% to 7.5%
Realistic Expectations	98	7.2%	5.9% to 8.7%
Sufficient End User involvement	113	8.3%	6.9% to 9.9%
Total Project Management Practices	**1365**		

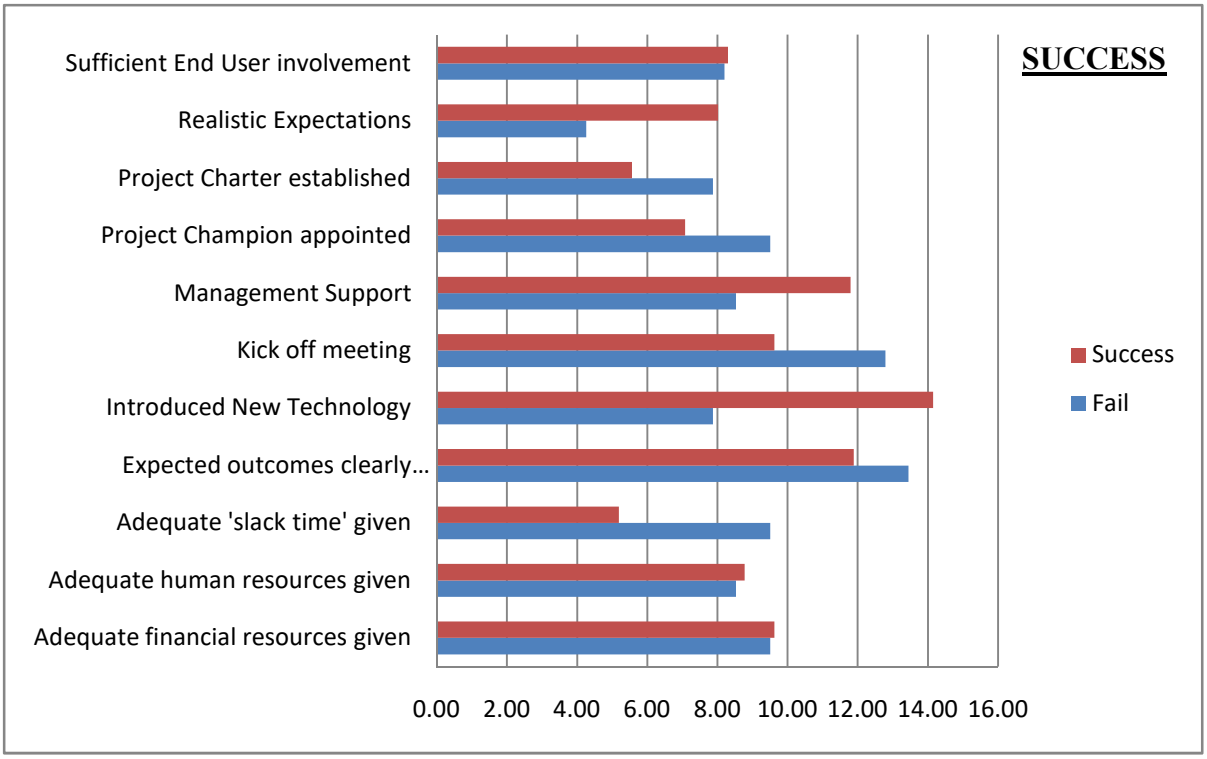

*Figure E1.*Distribution of Management Best Practices and Project Success

Table E2

Statwing Chi-Squared Results

Statwing Chi-Squared Test	Values
Statistical Significance (P-Value)	0.001709[a]
Effect Size (Cramér's V)	0.143603[b]
Sample Size	1365

Note.
[a]Clearly significant: This matches the excel calculation
[b]Small: This matches the excel calculation

Table E3

Cross tabulation & Chi Square Calculation from Excel

	Adequate financial resources given	Adequate human resources given	Adequate 'slack time' given	Expected outcomes clearly communicated	Introduced New Technology	Kick off meeting	Management Support	Project Champion appointed	Project Charter established	Realistic Expectations	Sufficient End User involvement	*Sums*
Fail												
Frequency	29.0000	26.0000	29.0000	41.0000	24.0000	39.0000	26.0000	29.0000	24.0000	13.0000	25.0000	305
Expected frequency	29.2711	26.5897	18.7692	37.3150	38.8791	31.5055	33.7399	23.2381	18.5458	21.8974	25.2491	
Row percent	9.5082	8.5246	9.5082	13.4426	7.8689	12.7869	8.5246	9.5082	7.8689	4.2623	8.1967	
Column percent	22.1374	21.8487	34.5238	24.5509	13.7931	27.6596	17.2185	27.8846	28.9157	13.2653	22.1239	
Total percent	2.1245	1.9048	2.1245	3.0037	1.7582	2.8571	1.9048	2.1245	1.7582	0.9524	1.8315	
Cell chi-square	0.0025	0.0131	5.5766	0.3639	5.6943	1.7828	1.7755	1.4287	1.6041	3.6152	0.0025	
Success												
Frequency	102.0000	93.0000	55.0000	126.0000	150.0000	102.0000	125.0000	75.0000	59.0000	85.0000	88.0000	1060
Expected frequency	101.7289	92.4103	65.2308	129.6850	135.1209	109.4945	117.2601	80.7619	64.4542	76.1026	87.7509	
Row percent	9.6226	8.7736	5.1887	11.8868	14.1509	9.6226	11.7925	7.0755	5.5660	8.0189	8.3019	
Column percent	77.8626	78.1513	65.4762	75.4491	86.2069	72.3404	82.7815	72.1154	71.0843	86.7347	77.8761	
Total percent	7.4725	6.8132	4.0293	9.2308	10.9890	7.4725	9.1575	5.4945	4.3223	6.2271	6.4469	
Cell chi-square	0.0007	0.0038	1.6046	0.1047	1.6384	0.5130	0.5109	0.4111	0.4615	1.0402	0.0007	
Sums	131.0000	119.0000	84.0000	167.0000	174.0000	141.0000	151.0000	104.0000	83.0000	98.0000	113.0000	**1365**

% Cells with E.F. < 5	**Chi-square**	**Degrees of Freedom**	**P**	**Contingency Coefficient**	**Cramer's V**
0	28.1488	10.0000	0.0017	0.1421	0.1436

Table E4

Logistic Regression of Management Best Practices and Project Success

Sample Size	1,365
Method	Logistic Regression
Model Fit (AICc)	1,444
McFadden's R-Squared	0.0198
95% Confidence Interval	

Regression parameters summary for Fail	Coefficients	Odds	P-value	Probability
Intercept [Introduce New Technology]	-1.8326	0.1600	**0.0000**	0.1379
MANAGE[Expected outcomes clearly communicated t]	0.7099	2.0337	**0.0124**	0.6704
MANAGE[Management Support]	0.2624	1.3000	0.3941	0.5652
MANAGE[Kick off meeting]	0.8712	2.3897	**0.0026**	**0.7050**
MANAGE[Adequate financial resources given]	0.5749	1.7770	0.0589	0.6399
MANAGE[Adequate human resources given]	0.5581	1.7473	0.0740	0.6360
MANAGE[Sufficient End User involvement]	0.5741	1.7756	0.0690	0.6397
MANAGE[Project Champion appointed]	0.8824	2.4167	**0.0044**	**0.7073**
MANAGE[Realistic Expectations]	-0.0451	0.9559	0.9030	0.4887
MANAGE[Adequate "slack time" given]	1.1925	3.2955	**0.0002**	**0.7672**
MANAGE[Project Charter established]	0.9331	2.5424	**0.0043**	**0.7177**

Regression parameters summary for Success	Coefficients	Odds	P-value	Probability
Intercept [Introduce New Technology]	1.8326	6.2500	**0.0000**	**0.8621**
MANAGE[Expected outcomes clearly communicated t]	-0.7099	0.4917	**0.0124**	0.3296
MANAGE[Management Support]	-0.2624	0.7692	0.3941	**0.4348**
MANAGE[Kick off meeting]	-0.8712	0.4185	**0.0026**	0.2950
MANAGE[Adequate financial resources given]	-0.5749	0.5628	0.0589	**0.3601**
MANAGE[Adequate human resources given]	-0.5581	0.5723	0.0740	**0.3640**
MANAGE[Sufficient End User involvement]	-0.5741	0.5632	0.0690	**0.3603**
MANAGE[Project Champion appointed]	-0.8824	0.4138	**0.0044**	0.2927
MANAGE[Realistic Expectations]	0.0451	1.0462	0.9030	**0.5113**
MANAGE[Adequate "slack time" given]	-1.1925	0.3034	**0.0002**	0.2328
MANAGE[Project Charter established]	-0.9331	0.3933	**0.0043**	0.2823

Table E5

Logistic Regression of Management Best Practices and Organizational Culture

Sample Size	1,365
Method	Logistic Regression
Model Fit (AICc)	1,395
McFadden's R-Squared	0.0589

Regression parameters summary for Fail	Coefficients	Odds	P-value	Probability
Intercept[Clan & New Technology]	-1.9843	0.1375	**0.0000**	0.1209
MANAGE[Expected outcomes clearly communicated t]	0.7020	2.0178	**0.0152**	0.6686
MANAGE[Management Support]	0.2503	1.2844	0.4234	0.5622
MANAGE[Kick off meeting]	0.9508	2.5877	**0.0013**	0.7213
MANAGE[Adequate financial resources given]	0.7173	2.0489	**0.0209**	0.6720
MANAGE[Adequate human resources given]	0.5392	1.7146	0.0908	0.6316
MANAGE[Sufficient End User involvement]	0.4475	1.5644	0.1656	0.6100
MANAGE[Project Champion appointed]	0.8474	2.3336	**0.0078**	0.7000
MANAGE[Realistic Expectations]	0.0326	1.0331	0.9309	0.5081
MANAGE[Adequate slack time given]	1.1758	3.2406	**0.0003**	0.7642
MANAGE[Project Charter established]	0.9441	2.5706	**0.0049**	0.7199
CULTUR[Middle]	-0.5675	0.5669	**0.0063**	0.3618
CULTUR[Create]	0.8902	2.4357	**0.0000**	0.7089
CULTUR[Compete]	0.2882	1.3341	0.1847	0.5716
CULTUR[Control]	-0.1034	0.9018	0.6867	0.4742

Regression parameters summary for Success	Coefficients	Odds	P-value	Probability
Intercept[Clan & New Technology]	1.9843	7.2737	**0.0000**	0.8791
MANAGE[Expected outcomes clearly communicated t]	-0.7020	0.4956	**0.0152**	0.3314
MANAGE[Management Support]	-0.2503	0.7786	0.4234	0.4378
MANAGE[Kick off meeting]	-0.9508	0.3864	**0.0013**	0.2787
MANAGE[Adequate financial resources given]	-0.7173	0.4881	**0.0209**	0.3280
MANAGE[Adequate human resources given]	-0.5392	0.5832	0.0908	0.3684
MANAGE[Sufficient End User involvement]	-0.4475	0.6392	0.1656	0.3900
MANAGE[Project Champion appointed]	-0.8474	0.4285	**0.0078**	0.3000
MANAGE[Realistic Expectations]	-0.0326	0.9680	0.9309	0.4919
MANAGE[Adequate slack time given]	-1.1758	0.3086	**0.0003**	0.2358
MANAGE[Project Charter established]	-0.9441	0.3890	**0.0049**	0.2801
CULTUR[Middle]	0.5675	1.7639	**0.0063**	0.6382
CULTUR[Create]	-0.8902	0.4106	**0.0000**	0.2911
CULTUR[Compete]	-0.2882	0.7496	0.1847	0.4284
CULTUR[Control]	0.1034	1.1089	0.6867	0.5258

Appendix F

Secondary Analysis: Number of Management Best Practices and the successful implementation of innovation

Table F1

Ranked T test on number of Management Best Practices

	Basic	Advanced
Statistical Significance (P-Value)	Not quite significant	0.061259
Effect Size (Cohen's d)	Small	0.216
Difference Between Averages (Fail – Success)		-0.347
Confidence Interval of Difference		-0.671 to -0.0238

Summary						
SUCCES Groups	Sample Size	Median	Average	Sum	Confidence Interval	Standard Deviation
Fail	109	2.0	2.8	305.0	2.52 to 3.08	2.0
Success	337	3.0	3.1	1,060.0	2.99 to 3.30	2.0

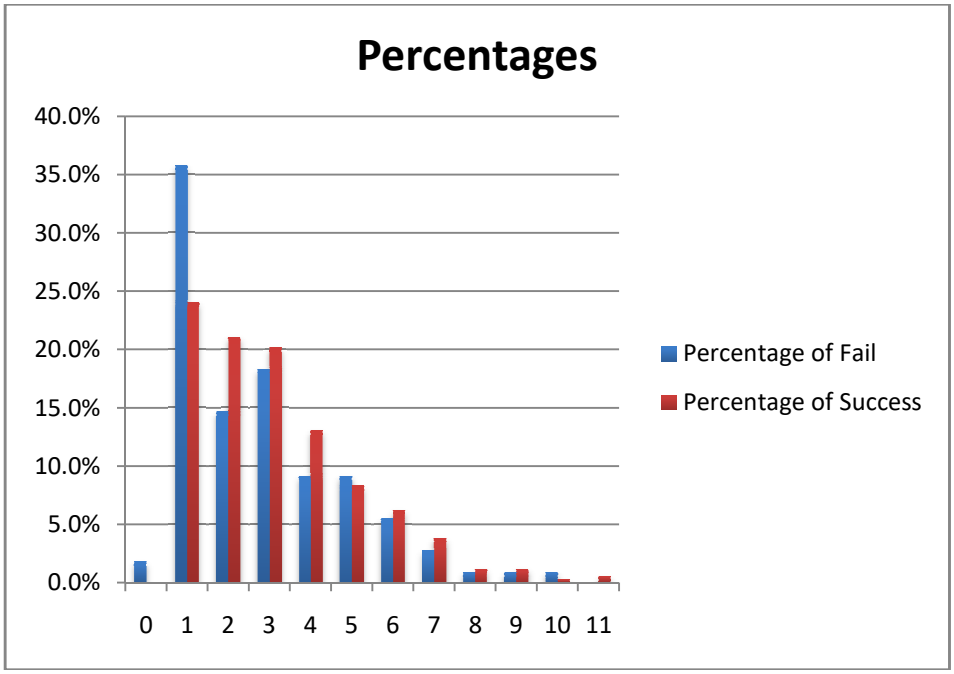

Figure F1. Distribution of number of best practices and implementation success

Appendix G

Hypothesis 3: Organizational Culture and Expected Outcomes and the successful implementation of innovation

Table G1

Distribution of Expected Innovation Outcomes

Categorical summary	Count	Percent of Data	Confidence Interval (Percent of Data)
Improved Costs	214	15.9%	14.1% to 18.0%
Improved External communications	80	6.0%	4.8% to 7.4%
Improved Internal Control	121	9.0%	7.6% to 10.7%
Improved Quality of Current Offerings	70	5.2%	4.1% to 6.5%
Improved Revenues	211	15.7%	13.9% to 17.8%
Improved Teamwork	181	13.5%	11.8% to 15.4%
Introduced New Capabilities	166	12.4%	10.7% to 14.2%
Introduced New Delivery of Current Offer	81	6.0%	4.9% to 7.4%
Introduced New Offerings	162	12.1%	10.4% to 13.9%
Introduced New Pricing of Current Offering	56	4.2%	3.2% to 5.4%

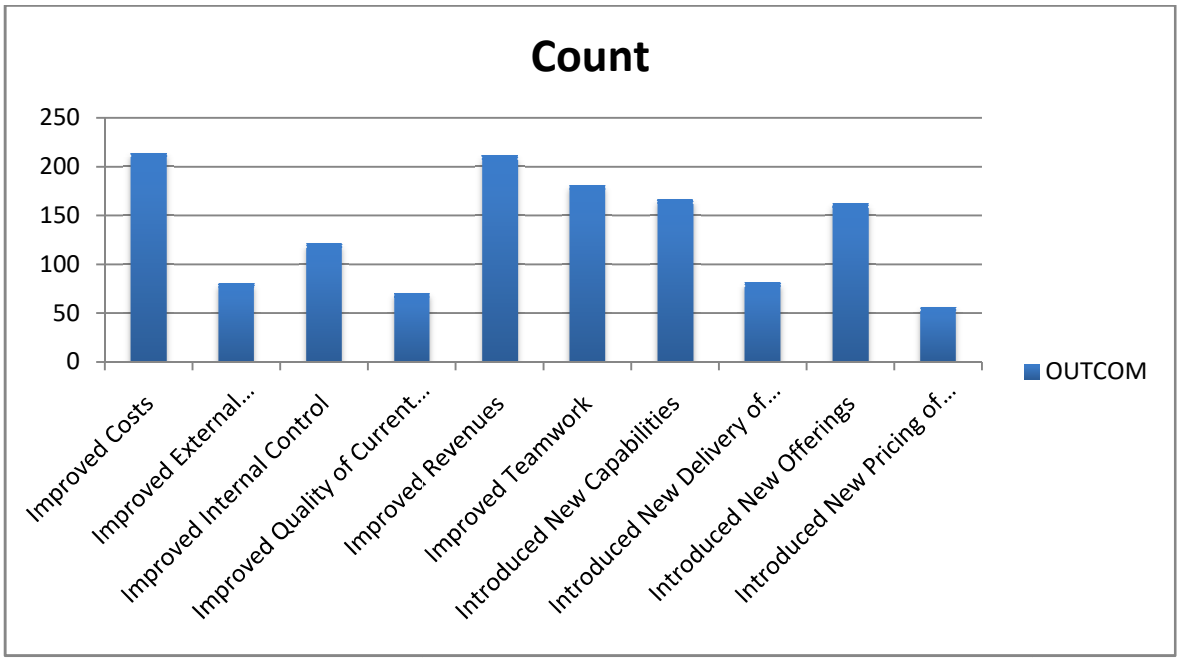

*Figure G1.*Distribution of Expected Innovation Outcomes

Table G2

Logistic Regression Expected Outcomes and Organizational Culture

Sample Size	1,342
Method	Logistic Regression
Model Fit (AICc)	1,371
McFadden's R-Squared	0.0537

Regression parameters summary for Fail	Coefficients	Odds	P-value	Probability
Intercept [Clan & Improve Costs]	-1.4780	0.2281	**0.0000**	0.1857
OUTCOM[Improved Revenues]	-0.3485	0.7057	0.1711	0.4137
OUTCOM[Improved Teamwork]	0.2309	1.2598	0.3444	0.5575
OUTCOM[Introduced New Capabilities]	-0.1428	0.8669	0.5823	0.4644
OUTCOM[Introduced New Offerings]	0.0404	1.0413	0.8739	0.5101
OUTCOM[Improved Internal Control]	0.1852	1.2034	0.4979	0.5462
OUTCOM[Introduced New Delivery of Current Offer]	-0.0887	0.9151	0.7816	0.4778
OUTCOM[Improved External communications]	0.2126	1.2369	0.5124	0.5530
OUTCOM[Improved Quality of Current Offerings]	0.0371	1.0378	0.9140	0.5093
OUTCOM[Introduced New Pricing of Current Offering]	-0.2557	0.7744	0.5191	0.4364
CULTUR[Middle]	-0.4767	0.6209	**0.0200**	0.3830
CULTUR[Create]	1.0740	2.9271	**0.0000**	**0.7454**
CULTUR[Compete]	0.6304	1.8783	**0.0035**	**0.6526**
CULTUR[Control]	0.0411	1.0419	0.8703	0.5103

Regression parameters summary for Success	Coefficients	Odds	P-value	%Success Probability
Intercept [Clan & Improve Costs]	1.4780	4.3844	**0.0000**	**0.8143**
OUTCOM[Improved Revenues]	0.3485	1.4169	0.1711	**0.5863**
OUTCOM[Improved Teamwork]	-0.2309	0.7938	0.3444	0.4425
OUTCOM[Introduced New Capabilities]	0.1428	1.1535	0.5823	0.5356
OUTCOM[Introduced New Offerings]	-0.0404	0.9604	0.8739	0.4899
OUTCOM[Improved Internal Control]	-0.1852	0.8310	0.4979	0.4538
OUTCOM[Introduced New Delivery of Current Offer]	0.0887	1.0927	0.7816	0.5222
OUTCOM[Improved External communications]	-0.2126	0.8085	0.5124	0.4470
OUTCOM[Improved Quality of Current Offerings]	-0.0371	0.9636	0.9140	0.4907
OUTCOM[Introduced New Pricing of Current Offering]	0.2557	1.2914	0.5191	0.5636
CULTUR[Middle]	0.4767	1.6107	**0.0200**	**0.6170**
CULTUR[Create]	-1.0740	0.3416	**0.0000**	0.2546
CULTUR[Compete]	-0.6304	0.5324	**0.0035**	0.3474
CULTUR[Control]	-0.0411	0.9598	0.8703	0.4897

Appendix H

Additional Analysis: Organizational Culture and the successful implementation of innovation

Table H1

Distribution of Organizational Culture by Successful Implementation

	Frequency	Percent	Cumulative Percent
Fail	*109*	*24.44*	*24.44*
Clan	35	32.11	32.11
Compete	16	14.68	46.79
Control	11	10.09	56.88
Create	24	22.02	78.90
Middle	23	21.10	100.00
Success	*337*	*75.56*	*100.00*
Clan	121	35.91	35.91
Compete	43	12.76	48.66
Control	40	11.87	60.53
Create	41	12.17	72.70
Middle	92	27.30	100.00

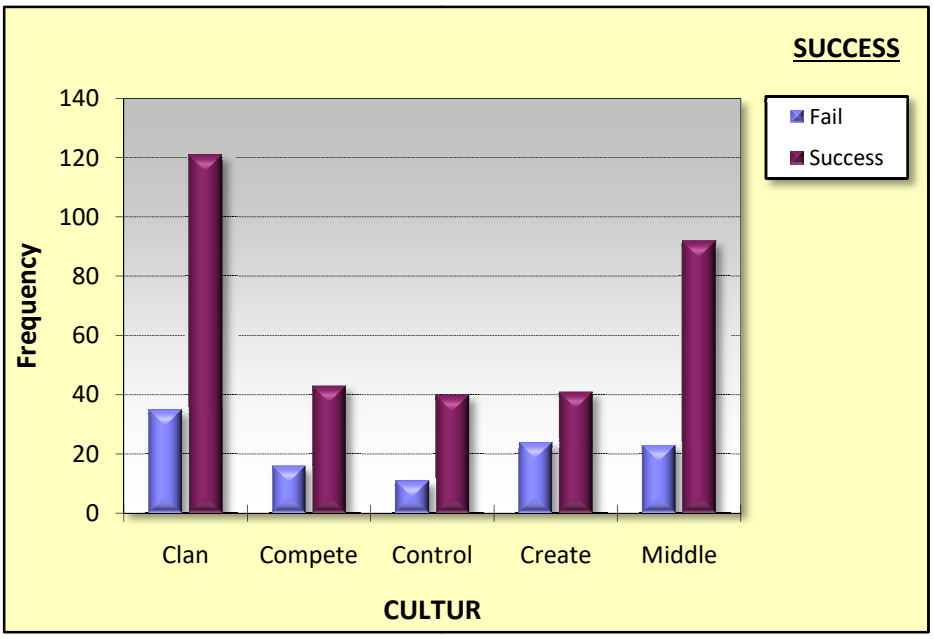

*Figure H1.*Distribution of Culture and Successful Implementation

Table H2

Cross Tabulation and Chi Square of Culture and Implementation Success

	Clan	Compete	Control	Create	Middle	Sums
Fail						
Frequency	35	16	11	24	23	109
Expected frequency	38.12556054	14.41928251	12.46412556	15.88565022	28.10538117	
Row percent	32.11009174	14.67889908	10.09174312	22.01834862	21.10091743	
Column percent	22.43589744	27.11864407	21.56862745	36.92307692	20	
Total percent	7.847533632	3.587443946	2.466367713	5.381165919	5.156950673	
Cell chi-square	0.256235673	0.173286554	0.171986687	4.14478925	0.927399515	
Success						
Frequency	121	43	40	41	92	337
Expected frequency	117.8744395	44.58071749	38.53587444	49.11434978	86.89461883	
Row percent	35.90504451	12.75964392	11.8694362	12.16617211	27.29970326	
Column percent	77.56410256	72.88135593	78.43137255	63.07692308	80	
Total percent	27.13004484	9.641255605	8.968609865	9.192825112	20.62780269	
Cell chi-square	0.082877414	0.056048173	0.055627741	1.34059949	0.29996008	
Sums	156	59	51	65	115	446

% Cells with E.F. < 5	**Chi-square**	**Degrees of Freedom**	**P**	**Contingency Coefficient**	**Cramer's V**
0	7.508810578	4	0.111321411	0.128674565	0.12975322

Table H3

Logistic Regression of Culture and Innovation Success

Sample Size	446
Method Logistic Regression	
Model Fit (AICc)	499
McFadden's R-Squared	0.0143

Regression parameters summary for Fail				
Parameters	Coefficients	Odds	P-value	Probability
Intercept[Clan]	-1.2404	0.2893	**0.0000**	22.44%
CULTUR[Middle]	-0.1459	0.8643	0.6291	46.36%
CULTUR[Create]	0.7049	2.0237	**0.0280**	66.93%
CULTUR[Compete]	0.2518	1.2864	0.4720	56.26%
CULTUR[Control]	-0.0505	0.9507	0.8971	48.74%

Regression parameters summary for Success				
Parameters	Coefficients	Odds	P-value	% of Success
Intercept[Clan]	1.2404	3.4571	**0.0000**	77.56%
CULTUR[Middle]	0.1459	1.1570	0.6291	53.64%
CULTUR[Create]	-0.7049	0.4941	**0.0280**	33.07%
CULTUR[Compete]	-0.2518	0.7774	0.4720	43.74%
CULTUR[Control]	0.0505	1.0518	0.8971	51.26%

Appendix I

Additional Analysis: Expected Outcomes in the Middle Culture and the successful implementation of innovation

Table I1

Distribution of Expected Outcomes for Middle Culture

Categorical summary	Count	Percent of Data	Confidence Interval
Improved Costs	63	18.6%	16.0% to 21.4%
Improved External communications	28	8.3%	6.5% to 10.4%
Improved Internal Control	32	9.4%	7.6% to 11.7%
Improved Quality of Current Offerings	11	3.2%	2.2% to 4.7%
Improved Revenues	55	16.2%	13.8% to 19.0%
Improved Teamwork	47	13.9%	11.6% to 16.4%
Introduced New Capabilities	37	10.9%	8.9% to 13.3%
Introduced New Delivery of Current Offer	16	4.7%	3.4% to 6.4%
Introduced New Offerings	34	10.0%	8.1% to 12.3%
Introduced New Pricing of Current Offering	16	4.7%	3.4% to 6.4%

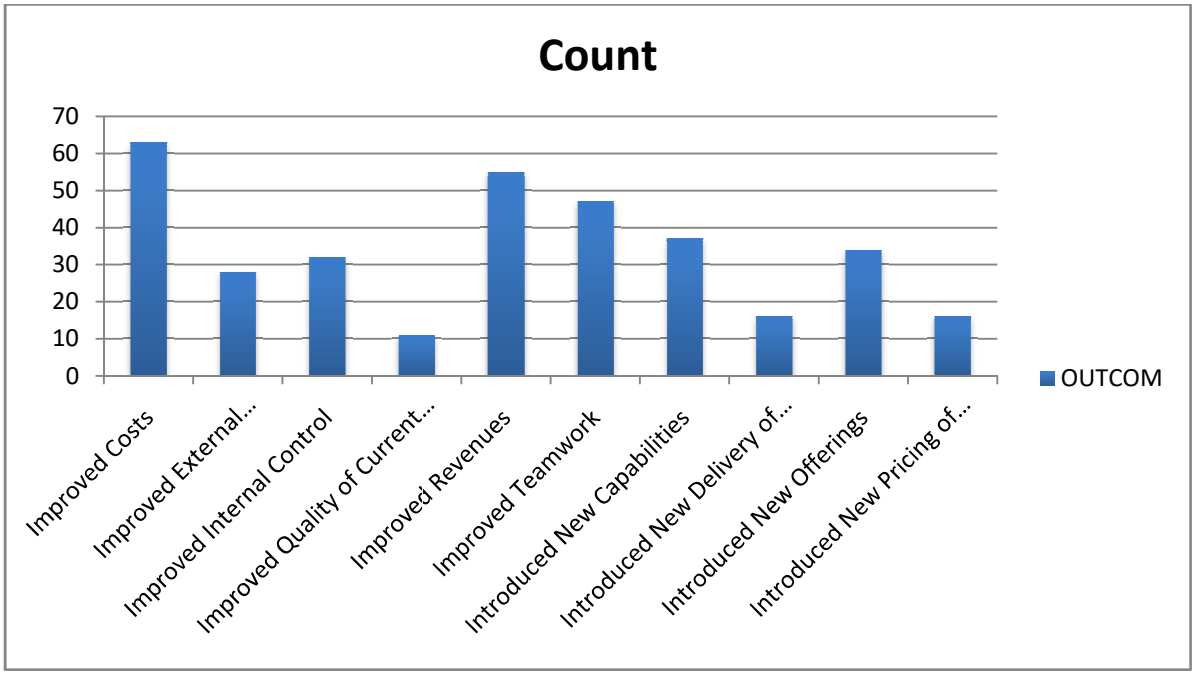

*Figure I1.*Distribution of Expected Outcomes and Middle Culture

Table I2

Logistic Regression Middle Culture Expected Outcomes and Project Success

Sample Size	339
Method	Logistic Regression
Model Fit (AICc)	266
McFadden's R-Squared	0.0350

Regression parameters summary for Fail	Coefficients	Odds	P-value	Probability
Intercept[Improved Costs]	-1.6677	0.1887	0.0000	0.1587
OUTCOM[Improved Revenues]	-1.1849	0.3058	0.0844	0.2342
OUTCOM[Improved Teamwork]	-0.4605	0.6310	0.4315	0.3869
OUTCOM[Introduced New Capabilities]	-1.1945	0.3029	0.1377	0.2325
OUTCOM[Introduced New Offerings]	-0.0902	0.9138	0.8795	0.4775
OUTCOM[Improved Internal Control]	-0.2782	0.7571	0.6618	0.4309
OUTCOM[Improved External communications]	0.1417	1.1522	0.8140	0.5354
OUTCOM[Introduced New Pricing of Current Offeri]	-0.2782	0.7571	0.7377	0.4309
OUTCOM[Introduced New Delivery of Current Offer]	0.5691	1.7667	0.3974	0.6386
OUTCOM[Improved Quality of Current Offerings]	0.1636	1.1778	0.8481	0.5408

Regression parameters summary for Success	Coefficients	Odds	P-value	Probability
Intercept[Improved Costs]	1.6677	**5.3000**	**0.0000**	**0.8413**
OUTCOM[Improved Revenues]	1.1849	**3.2704**	**0.0844**	**0.7658**
OUTCOM[Improved Teamwork]	0.4605	**1.5849**	0.4315	**0.6131**
OUTCOM[Introduced New Capabilities]	1.1945	**3.3019**	0.1377	**0.7675**
OUTCOM[Introduced New Offerings]	0.0902	1.0943	0.8795	0.5225
OUTCOM[Improved Internal Control]	0.2782	1.3208	0.6618	0.5691
OUTCOM[Improved External communications]	-0.1417	0.8679	0.8140	0.4646
OUTCOM[Introduced New Pricing of Current Offeri]	0.2782	1.3208	0.7377	0.5691
OUTCOM[Introduced New Delivery of Current Offer]	-0.5691	0.5660	0.3974	0.3614
OUTCOM[Improved Quality of Current Offerings]	-0.1636	0.8491	0.8481	0.4592