

ABSTRACT

BUI, KEVIN DANIEL. Examining the Relationship between Company Culture and Six Sigma Project Success. (Under the direction of Dr. Lori Rothenberg).

The purpose of this research was to examine the relationship between the underlying company culture of a textile company and the company's Six Sigma projects' success. The research on company culture and quality improvement is independently vast. In spite of this, little research has been done on company culture and the relationship it has with quality improvement projects. The culture of a company is one that affects how employees perform the tasks set before them. As a result this may affect the success of quality improvement projects, such as Six Sigma, that seek to reduce costs and improve the quality of the company's products or services.

In order to further investigate this relationship, the culture of a North Carolina textile company was surveyed using an organizational culture survey developed by Dr. Carl Fey and Dr. Daniel Denison (2003). Fey and Denison identified involvement, consistency, adaptability and mission as factors that reveal themselves in a company's culture. The survey was administered to Six Sigma trained or certified employees within the textile company, and interviews were conducted with Six Sigma certified employees.

The findings from the survey, interview, and personal observations indicated that the textile organization struggled with all aspects of company culture as identified by Fey and Denison. This textile company and others should focus on improving the values and goals of the company, the mission, and team involvement.

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Examining the Relationship between Company Culture
and Six Sigma Project Success

by
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DEDICATION

This work is dedicated to my loving wife, Heather Bui, and to my father and mother.

BIOGRAPHY

Kevin Bui was born and raised in Raleigh, North Carolina, in March of 1989. He is the son of Hai Bui and Lan Tran (Bui), and has one younger sister, Sharon. In 2007, Kevin moved to Wilmington, North Carolina, to attend college at the University of North Carolina at Wilmington (UNCW). While at UNCW, he was President of then Campus Crusade for Christ (currently known as Cru) and was a student technician at the on-campus laptop repair shop, B1NAR1ES Technology Store. In May of 2011, Kevin graduated with a Bachelor of Science in Business Administration with a concentration in Finance and minor of Information Technology. With interest in Lean Six Sigma, Kevin became connected with Textile Extension for Economic Development, a leader in Lean Six Sigma training, and was accepted into the Master's program at North Carolina State University. He accepted an offer from Textile Extension to become a graduate research assistant in June 2011. In the summer of 2012, Kevin interned at a textile manufacturing plant in the Continuous Improvement department. He plans to complete the requirements to graduate in May 2013 with a Master's of Science in Textiles.

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CHAPTER 1: INTRODUCTION AND OBJECTIVE

Very little quantitative research has been conducted on company culture in the context of quality improvement methods. The topic of company culture is one that is continually highlighted every year by lists such as “Top 100 Companies to Work For” by Forbes magazine. Despite these lists being the most public, company culture is a subject that is vast with a lot of research and company case studies being done on the topic. Researchers have argued that the culture of an organization is identified by certain qualities that are exhibited by the employees. These qualities of company culture vary from researcher to researcher, but there are overlapping topics such as teamwork and leadership (Schneider et al. 2013). Each company culture researcher assessed their qualities using survey instruments that are according to what they believe to be the factors of a company culture. As a result, the culture of a company may have an impact on the work that is done, such as work on quality improvement projects.

Quality improvement methods can be dated back to before the 1900s. Over the years these methods have evolved and there are many different methods to improve quality of products of services. These methods include, but are not limited to, Total Quality Management (TQM), ISO Standards, Balance Scorecards, and Six Sigma. Each company has adopted one of these practices or formulated one of their own quality practices to meet their needs. The overall goals of these methods are to reduce costs, improve quality and increase revenue for the company. In particular, the practice of Six Sigma is typically accomplished

by forming teams from different departments of an organization, and thus harboring conditions for the culture of the company to reveal itself.

Six Sigma has been proven to be successful when working in teams and when the leadership is committed to the methodology of reducing defects. Both facets of leadership commitment and teamwork are identified in Fey and Denison's research (2003), and are evaluated in this research. Additionally, Six Sigma methodology has an output of hard dollar cost savings and improved customer satisfaction. By understanding what factors in a company's culture impacts the cost savings of a Six Sigma quality improvement project, the leaders of a company can understand what makes their Six Sigma projects successful. The following research is not of a model for a culture, but more to provide an assessment for companies to use to evaluate their own culture.

1.1 Objective of Research

Based on this dynamic between company culture and Six Sigma, the purpose of this study is to examine the relationship between the culture of a company and the success of Six Sigma projects. This research will take an in-depth look at the kind of business environment a North Carolina textile manufacturing facility harbors in their pursuit of Six Sigma quality. This research will look at key factors for company culture as identified in previous research (Corbett, 2011; Davison & Al-Shaghana, 2007; Deem et al., 2010; Denison, 1984; Hendricks & Singhal, 1996; Zu et al., 2010) on the correlation between these factors and the bottom-line profits for companies. This research aims to provide companies with guidance as to what areas of their culture should be changed for a successful Six Sigma initiative. Also, the

results of the study will be shared with the textile company that was in focus and recommendations will be made to assist in improving their culture. The research utilized a survey and interviews to collect data on the culture of a textile company. Both research instruments were focused on individuals who had been Six Sigma certified or were currently in the process of being certified. The survey helped gauge the culture of the participating textile company with those who have an understanding of Six Sigma, and assess where the company could move forward in their efforts.

1.2 Significance of Study

This research is important, as it will reveal how an employee's work environment is related to their work on projects for the company. The result of this research could lead to recommendations about how much time and money should be invested in the shaping of a company's culture toward Six Sigma success. This study will offer a company a way to evaluate if their company's culture is appropriate for successful application of Six Sigma. When a company exhibits the four characteristics that Fey and Denison (2003) have identified, the hard dollar savings of quality improvement projects are controlled and sustained. By identifying these characteristics within a company, the organization's leaders are made aware of where their company may be lacking, and can work towards improving it.

CHAPTER 2: LITERATURE REVIEW

2.1 Company Culture

With every group of people there is an environment that develops over time, and as a result this environment can have underlying effects on each person. This environment that is created is typically called the culture of that group. The culture created is one where the “set of values, beliefs, and behavior patterns” have become the “core identity of an organization” (Denison 1984, p. 5).

Across the literature there are varying definitions of what culture is in the context of a company. Schneider, Ehrhart, and Macey (1996) state that “culture concerns the firmly implanted beliefs and values of organizational members, it resides at a deeper level of people’s psychology. . . . Culture captures a less conscious, more subtle psychology of the work place” (p. 5). Howard Schwartz and Stan Davis define culture as “a pattern of beliefs and expectations shared by the organization’s members. These beliefs and expectations produce norms that powerfully shape the behavior of individuals and groups” (as cited in O’Reilly, 1989, p. 12). Many researchers have crossed the idea of company culture with what is known as company climate, though there is a distinction between the two that will be discussed later. Edgar Schein is one of the leaders in research on organizational culture and defines it as:

A pattern of basic assumptions, invented, discovered, or developed by a given group, as it learns to cope with its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore is to be taught to

new members as the correct way to perceive, think, and feel in relation to those problems. (as cited in Deem, 2010, p. 32)

With consideration to the different definitions of company culture presented, Schein's definition will be the working definition of company culture for this study.

2.1.1 Company Culture vs. Company Climate

Even though Schein provides a foundational definition of what company culture is, the topic of company climate was mixed in to some company culture discussions. The literature conveys a major distinction between company climate and culture. The climate of a company is the current conditions and habits of employees across business units (Glick, 1985; Schneider, 1996). The culture of a company is reflected in the core beliefs and values of the company. The climate of a company comes from these core beliefs and values, but climate is representative of what the company truly believes and values. As Schneider et al. states, the "practices and rewards" exhibited by the company "make people believe that management values quality" (1996, p. 5). Baer and Frese (2003) support this definition of organizational climate and find that climate "is the property of individuals and refers to how individuals in an organization generally perceive the organization...an organizational climate does not exist if people substantially differ in the way they perceive organization characteristics" (p. 47).

Schneider et al.'s recent survey of organizational culture and climate literature show that throughout history, studies have balanced back and forth between the two (2013). In recent studies, culture has been more often studied, but has shown some overlapping issues

with climate (Schneider et al., 2013). This study will look at a model of culture and how much a company deviates from that model of culture.

2.1.2 Frameworks of Company Culture

There are many models pertaining to how the culture of a company should be evaluated (Bower, Davies, Jung, Mannion, McNally, Scott and Whalley, 2009). One model is Hofstede's model used to examine twenty different business units across ten different organizations in Denmark and the Netherlands (Hofstede, Neuijen, Ohayv, & Sanders, 1990). Hofstede et al. determined there were four components in which company culture manifests itself: symbols, heroes, rituals and values; they determined that symbols, heroes and rituals could be "subsumed under the term 'practices,' because they are visible to an observer although their cultural meaning lies in the way they are perceived by insiders" (1990, p. 291); whereas values are the core upon which company culture is formed, but are "often unconscious and rarely discussable. . . . [They are] manifested in alternatives of behaviors" (Hofstede et al., 1990, p. 291).

One model for assessing company culture is Dr. Robert Quinn and Dr. Kim Cameron's (Organizational Culture Assessment Instrument (OCAI) (Twati & Gammack, 2006). The OCAI components are the foundation of Dr. Quinn and Dr. John Rohrbaugh's Competing Values Framework (CVF), which serves as an additional organizational culture assessment in itself. Quinn and Cameron believe that organization's culture could fit into four different groups: hierarchy culture, market culture, clan culture, or "adhocracy" culture (Twati & Gammack, 2006, p. 182). The hierarchy model "sees key values centered on

maintaining efficient, reliable, fast, smooth-flowing productions or services” (Twati & Gammack, 2006, p. 182). A market culture values competitiveness and productivity (Twati & Gammack, 2006). The clan culture functions like an “extended family where shared values, beliefs and goals, participation, individuality, and a sense of ‘we’ exist” (Twati & Gammack, 2006, p. 182). Last, the adhocracy culture “is temporary and characterized by a dynamic, entrepreneurial and creative workplace” (Twati & Gammack, 2006, p. 182).

Different models serve for different areas of focus and outcomes, while the others are general and an overall evaluation of the culture. In addition, some models were made for international evaluation whereas some were regional or company-specific. Bower et al. (2009) studied seventy different organizational culture instruments and found that only forty-eight of the models provided psychometric information. Noted in the list of culture survey instruments was that several of the instruments were the same, but had a slight permutation for the purpose of a different study. Despite the vast assortment of survey instruments, many of the studies cited Dr. Daniel Denison in their research. As a result, many others have taken Denison’s model and modified it for their study. This study will follow suit.

Denison’s Organizational Culture Survey Instrument (OCSI) was chosen because the survey serves an overall assessment of organizational culture. The instrument has been widely used by other organizational culture researchers in different industries and countries.

2.2 Fey and Denison’s Framework for Company Culture and Effectiveness

The literature provides a wide range of factors that have implications on culture of a company or organization (Deem, 2010; Denison, 1984; Hofstede et al., 1990; O’Reilly, 1989;

Schneider, 1996; Twati & Gammack, 2006). Based on these studies, company culture can be seen as complex and researchers cannot agree on whether culture can be measured. Another concern is that if culture can be measured, then how does it get measured (Fey & Denison, 2003)? Fey believed that culture could be measured and constructed a framework for measuring company culture based on Denison's foundations. The four key cultural traits of effective organizations as determined by Fey and Denison are involvement, consistency, adaptability and mission.

2.2.1 Fey and Denison's Culture Factor of Involvement

Fey and Denison's first culture factor of involvement can be seen in early studies of company culture, as involvement and teamwork is used interchangeably. Shim and Steers (2012), in their study on symmetric and asymmetric leadership cultures, calls the involvement of employees in team activities and projects "collectivism" (p. 584). They showed collectivism at work this in their case study analysis of Hyundai and Toyota. Hyundai was found to have a "'we and me' culture that encourages commitment to and cooperation with both the organization as a whole and their individual teams" (Shim & Steers, 2012, p. 587). In contrast to Hyundai is Toyota's culture, which boasts just a simple "we" culture in which their employees' responsibility is to cooperate cross-functionally to "achieve maximum return for the company as a whole" (Shim & Steers, 2012, p. 587). Thus, Hyundai, which is influenced by the culture of the country, South Korea, exhibited higher team cohesiveness than Toyota, which reflected the cultures Japan and the United States according to GLOBE findings (Shim & Steers, 2012).

The involvement and team cohesiveness of a company attributes to a major portion of company culture as it affects employee retention. According to Sheridan (1992), employee retention and commitment of the employees will drive the psychological culture of the company. Employees who tend to be committed to an organization long-term and exhibit loyalty are part of cultures that “emphasize values of teamwork, security, and respect for individual members” (Sheridan. 1992, p. 1038). Further emphasized in Sheridan’s study is finding that employees “work tasks values of detail, stability, and interpersonal relationship values of team orientation and respect for people explained most of the variance across firms” (Sheridan, 1992, p. 1044).

Literature suggests that highly involved organizations “empower people, organize around teams, and develop human capability” (Denison, Janovics, Young, & Cho, 2006; Shim & Steers, 2012). Also, Denison et al. (2006) suggests that companies that embrace these elements of involvement culture develop an “informal, voluntary and implicit control systems” (p. 6). The trait of involvement is measured by three indices (Denison et al., 2006):

Empowerment - Individuals have the authority, initiative, and ability to manage their own work. This creates a sense of ownership and responsibility toward the organization.

Team Orientation - Value is placed on working cooperatively toward common goals for which all employees feel mutually accountable. The organization relies on team effort to get work done.

Capability Development - The organization continually invests in the

development of employee's skills in order to stay competitive and meet on-going business needs.

These components will be identified in the survey that will be administered to participants. All of the attributes of Denison's involvement factor show that it has the largest contribution of impact on the success of a Six Sigma project. Denison's survey has three more factors, consistency, adaptability, and mission.

2.2.2 Fey and Denison's Culture Factor of Consistency

Their next factor of consistency has been regarded throughout literature as a primary definition of company culture (O'Reilly, 1989; Sheridan, 1992). The consistency of a company tends to point to the core values that the company holds to be true. Though not easily measurable, consistency can be viewed by observing the leaders of the company and those who are under those leaders. Charles O'Reilly (1989) found that there is a difference between the guiding beliefs and vision of top management versus what is carried out daily by the lower members of the organization. O'Reilly goes on to say that "It is a common occurrence to find a noble sounding statement of corporate values framed on the wall and a very different and cynical interpretation of this creed held by people who have been around long enough to realize what is really important" (1989, p. 13).

Without consistency, the culture of the company will have a tendency to be highly involved, where the culture is developed by individuals in an "inductive manner" (Denison & Mishra, 1995). On the other hand, companies that exhibit consistency throughout are "highly

uniform, well-coordinated, and well integrated” (Fey & Denison, 2003). The trait of consistency is measured by three indices (Denison et al., 2006):

Core Values - Members of the organization share a set of values, which create a sense of identity and a clear set of expectations.

Agreement - Members of the organization are able to reach agreement on critical issues. This includes both the underlying level of agreement and the ability to reconcile differences when they occur.

Coordination and Integration - Different functions and units of the organization are able to work together well to achieve common goals.

Organizational boundaries do not interfere with getting work done.

The consistency from management to the lower levels should remain the same over time and cross-functionally. If there is consistency there, and all of management backs up their words with actions, the results should benefit the company.

Involvement and consistency are important, but companies also are constantly faced with new demands.

2.2.3 Fey and Denison’s Culture Factor of Adaptability

In spite of involvement and consistency proving to have major implications on the culture of a company, many companies can find themselves stuck in their ways and not willing to change. The world today is in constant fluctuation as consumers are changing and their needs are changing with them. In addition to being able to create change within the company with focus on customers, how a company learns from their own moments of

failures and moments of success are keys to a company culture. A question that management and company leaders should ask themselves is, “How does this company handle failure. Is it a setback or an opportunity to learn and move forward?” Employees will look to the company’s leaders in times of crisis and ask how to interpret this setback and what to do. O’Reilly (1989) advocates that “strong cultures are typically characterized by consensus about these questions” (p. 22).

Denison and Mishra (1995) explain that adaptability is developing “norms and beliefs that support its capacity to receive and interpret signals from its environment and translate these into internal cognitive, behavioral and structural changes” (p. 215). Therefore, adaptability can be characterized in companies that are “driven by customers, take risks and learn from their mistakes, and have capability and experience at creating change” (Fey & Dennison, 2003, p. 5). The trait of adaptability is measured by three indices (Denison et al., 2006):

Creating Change - The organization is able to create adaptive ways to meet changing needs. It is able to read the business environment, react quickly to current trends, and anticipate future changes.

Customer Focus - The organization understands and reacts to their customers and anticipates their future needs. It reflects the degree to which the organization is driven by a concern to satisfy their customers.

Organizational Learning - The organization receives, translates, and interprets signals from the environment into opportunities for encouraging

innovation, gaining knowledge, and developing capabilities.

Being a dynamic company adjusting to customer needs and learning from setback are keys for any company. Also, being a leader as an organization in innovating and creating change in the industry is important to being a standout company. These factors will lead to success in projects as the business environment is constantly changing. Involvement, consistency, and adaptability are central to the culture of a company. However, it is an incomplete assessment of culture without attention to the mission of a company.

2.2.4 Fey and Denison's Culture Factor of Mission

Finally, at the core of most companies are a mission, vision and goals they need to reach to be successful in the industry. Some companies have the mission and vision of the company posted on the walls of the company's facilities for employees to clearly see every day, but these efforts are not enough in most cases.

Denison and Mishra (1995) observed that a mission combining economic and noneconomic objectives gave the company employees a clear sense of meaning and direction for their work. As a result, the mission variable can be characterized as having "clear sense of purpose and direction defining goals and strategic objectives and expressing a vision of the future" (Fey & Dennison, 2003). The trait of mission is measured by three indices (Denison *et al.* 2006):

Strategic Direction and Intent - Clear strategic intentions convey the organization's purpose and make it clear how everyone can contribute and

“make their mark” on the industry.

Goals and Objectives - A clear set of goals and objectives can be linked to the mission, vision, and strategy, and provide everyone with a clear direction in their work.

Vision - The organization has a shared view of a desired future state. It embodies core values and captures the hearts and minds of the organization’s people, while providing guidance and direction.

These four factors for company culture have been proven to be valuable metrics across different industries and countries. The validity and reliability of Fey and Denison’s Organizational Culture Survey Instrument is given in their study on Russian companies with all of the Cronbach’s alphas being greater than .70. Their instrument also has “good convergence and discriminant validity” (Fey & Dennison, 2003). Further, Denison and Mishra (1995) found that involvement and adaptability are indicators of the change and flexibility of an organization, while mission and consistency attribute themselves to the stability and direction. Empirical research on the culture of companies practicing Six Sigma using Denison’s survey, cannot be found. Six Sigma is a specific quality methodology and management style.

2.3 Brief Overview of Six Sigma

Six Sigma is one of the most recognized quality management systems present in today’s world of business. The problem-solving methodology has evolved since being introduced by Motorola in the 1980s and made popular by General Electric in the 1990s.

Companies have made the methodology their own but kept the base principles and teachings of Six Sigma, in particular the elements of define, measure, analyze, improve, and control (DMAIC) (Corbett, 2011; Lagrosen, 2009). The most recognized outcomes of a Six Sigma project are the financial benefits and customer satisfaction levels.

Six Sigma is a problem-solving methodology that takes place within a company to help reduce cost and improve quality by improving the capability of the organization's processes (Corbett, 2011; Jeyaraman & Teo. 2010; Das, Roy & Antony, 2007; Kanji, 2008). Using a structured methodology of DMAIC and statistical methods, Six Sigma eliminates any variations in the processes of the organization. The statistical methods used in Six Sigma make the method data-driven and fact-driven. Therefore, the decisions that are made in Six Sigma are not based on feelings and personal opinions (Brue, 2006).

Six Sigma project teams typically consist of employees from different business units of a company. The employees selected for each project have the knowledge and skill set that will be maximized to successfully complete the project. There is a variety of literature explaining the makeup of project teams, but few studies that tackle the culture of the company and its effect on the project team (Pisani, Hayes, Kumar & Lepisto, 2009; Sheridan, 1992; Shim & Steers, 2012;). Very few of these studies examine the textile industry. This study will focus on these successes of Six Sigma projects and the roots of the project team.

2.3.1 Six Sigma in the Textile Industry and Literature

Several companies in the textile industry have taken up Six Sigma initiatives to increase their cost savings (Antony , Kumar & Madu,2005) . The DMAIC process of Six

Sigma compliments the textile industry very well as there are opportunities for quality improvement in the large processes of manufacturing textiles. In Antony et al.'s (2005) study of Six Sigma in 400 small and medium sized enterprises in the United Kingdom, about 5% of the companies participating were from the textiles industry. They found that the textiles industry had the lowest number of Green Belts and Black Belts (2005). This supports why literature regarding Six Sigma in textiles is not vast. In spite of this, there is some foundation for the practice of this quality improvement methodology in the textile industry. Some defective processes in a textile company may include "low strength of flax yarn, low productivity of autoconer, lot-to-lot shade variation, or late delivery of production from dispatch" (Das et al., 2007).

Das et al.'s (2005) research used the DMAIC methodology in their project, and they were able to reduce lot-to-lot shade variation in their textile company. Their research provides a valuable sense of what purpose Six Sigma projects take on in the textile industry. The purpose of Six Sigma in textiles can be derived from Das et al.'s (2005) research and defined as having a purpose "to improve productivity, reduce the cost of poor quality, reduce the process cycle time, deliver the product to the customer on time, and to impart moral strength to shop floor people" (2007, p. 230). Due to the potential success of Six Sigma in the textile industry, there is value in researching the company culture of a textile company that practices Six Sigma methodology. The literature on Six Sigma and culture in other types of companies can provide insight on what might be expected in textiles.

2.3.2 Existing Relationships between Six Sigma and Culture

Today, the aspects of Six Sigma and Company Culture are not explored together as having a relationship with each other. Though this is not a common link throughout literature, there are many studies that have considered the quality culture to be the company culture (Davison & Al-Shaghana, 2007; Sinclair & Collins, 1994). Joseph Juran and Edward Deming believed that a culture that pursued quality was one that involved changing people's behavior before their attitudes. For example, managers should be required to participate in quality improvement projects rather than just "urged to change their attitudes" (Davison & Al-Shaghana, 2007). Additionally, Deming recommends that his '14 obligations' be implemented into the overall culture of the organization. The '14 obligations' include training employees in quality tools and having "a more participative style of management" (as cited in Davison & Al-Shaghana, 2007, p. 252). Davison and Al-Shaghana (2007) defined several areas that define a successful Six Sigma based culture: "motivation, reward, organizational policy and values, environment, and organizational structure" (p. 251).

In Davison and Al-Shaghana's (2007) study, they compared Six Sigma companies to non-Six Sigma companies and found that the culture dimensions that rated the lowest were teamwork and empowerment. As a result, they concluded that Six Sigma companies are not embracing employee input and participation as a key principle to the success of exceptional quality. This is in concordance with findings in the literature that effective implementations of Six Sigma have cultures that "encourage open communication and employee involvement" (Zu, Robbins, & Fredendall, 2010, p. 97).

Most notable is that Six Sigma on its own may not be sufficient in harboring a successful quality culture. The inclusion of other practices such as Total Quality Management (TQM) is important and complementary in achieving true continuous improvement (Zu et al., 2010). There are present day efforts to reward quality in companies. These incentives may contribute to the culture needed to be successful with quality improvement initiatives.

2.4 Current Efforts in Corporations Today

The literature portrays a lot of examples and theories of the past, but how is company and outstanding quality awarded today? One way to understand what is currently happening in industry with culture and quality is to look at rewards and recognitions handed out to companies by evaluators. The company culture of an organization can be understood by being recognized as a “Top 100 Companies To Work For” set out by one of the business media outlets. Simon and DeVaro (2006) support the American Customer Satisfaction Index (ACSI) being a direct result of workplace environment instead of financial performance (2006). As for being recognized for excellence in quality, the Malcom Baldrige Award is highly recognized globally as a standard to aim for.

Within companies, individuals may be awarded for excellent performance of their work through recognition or raises. Employees may be awarded “Employee of the Month” or “Employee of the Year” bringing recognition upon them and their efforts. O’Reilly (1989) believed that receiving recognition for success was more compelling than receiving annual bonuses for accomplishments. As discovered by the famous behavioral psychologist Burrhus

Frederic Skinner, reward and recognition provide positive conditioning that reinforces and encourages repeating similar behavior.

2.4.1 Company Culture Recognition

Every year, popular business media outlets like Forbes, Fortune and Bloomberg release a listing of “Top 100 Companies to Work For.” The criteria for these listings are not simply based on salary and compensation alone, but involve the culture of the company. Factors such as teamwork, innovation, and company mission play a key role in being included on this list. Fulmer et al. (2003) states that a key facet of what makes a best company to work for are employee attitudes and relations (as cited in Simon & DeVaro, 2006, p. 667). If employees exhibit a positive attitude about their work, then the “quality of their workforces as well as the intensity of employee effort” will increase and yield “improved product and service quality” (Simon & DeVaro, 2006, p. 668). When employee attitudes are positive, they will attract new employees and the customer experience is enhanced.

In addition, the status of being one of the best companies to work for tends to benefit companies listed. The companies on the list will experience higher customer satisfaction than those not listed by a business media outlet (Simon & DeVaro, 2006). Simon & DeVaro does identify service companies benefit more from being listed than manufacturing companies (2006). Regardless of type of company, being recognized for outstanding product or service quality is one that brings awareness to a company.

2.4.2 Recognition for Quality

Winning a quality award by a firm “provides evidence that the firm has implemented an effective quality improvement program” (Hendricks & Singhal, 1996, p. 416). The quality awards that are more recognizable by industries are ones given out by independent organizations. For example, there is the Philip Crosby Quality Award, International Quality Award, and others. The Philip Crosby Quality Award is based on nominations from the customers of clients in Crosby’s Quality College (Easton & Jarrell, 1999). Further, the Malcolm Baldrige National Quality Award is the most relative to Six Sigma with the first award being given to Motorola for their Six Sigma program.

In 1987, the Malcolm Baldrige National Quality Award was created to recognize companies who exhibited exceptional of quality products and services. The Baldrige Award focuses on seven different areas: leadership, strategic planning, customer and market focus, information and analysis, human resource focus, process management and business results (NIST as cited in Jacob, Madu, & Tang, 2004). Motorola was the first to achieve this reward in 1988 with their pursuit of “zero defects in everything we do.” In order to achieve this award, they utilized the skill of Six Sigma and were able to succeed in achieving a tenfold improvement in quality. Motorola developed a Participative Management Program (PMP) in order to better understand what defects to attack and involve all their employees in the resolution of defects.

Jacob et al. (2004) found that the Baldrige Award caused many to disagree on whether there is a positive financial impact on a company’s performance or not. In their

study, Jacob et al. (2004) used an extensive amount of statistics to draw conclusions unlike researchers that came before them. They found that winning the Baldrige Award does create financial value for a company compared to other companies within the same industry. Also, there is no significant difference in value between the years before and after of which a company wins an award (Jacob et al., 2004).

The Malcolm Baldrige Award is a prestigious award to win, but is not the only cornerstone that helps in developing healthy company culture and financial performance for a company. Despite this, winning the Baldrige Award would be beneficial to any company, even increasing revenue or stock prices as noted by Hendricks and Singhal (1996).

2.5 Research Objectives

1. Utilize Fey and Denison's Organizational Culture Survey Instrument (OCSI) (2003) to assess a company's culture of involvement and the relationship it has with the hard dollar savings of Six Sigma projects
2. Utilize Fey and Denison's OCSI to assess a company's culture of consistency and the relationship it has with the hard dollar savings of Six Sigma projects
3. Utilize Fey and Denison's OCSI to assess a company's culture of adaptability and the relationship it has with the hard dollar savings of Six Sigma projects

4. Utilize Fey and Denison's OCSI to assess a company's culture of mission and the relationship it has with the hard dollar savings of Six Sigma projects
5. Conduct interviews to qualitatively assess a company's culture of involvement, consistency, adaptability and mission
6. Conduct personal observations to qualitatively assess company's culture of involvement, consistency, adaptability and mission

CHAPTER 3: METHODOLOGY

This research was done using a survey developed by organizational researchers, Dr. Carl Fey and Dr. Daniel Denison (Fey & Denison, 2003). Fey and Denison's key factors for a successful company culture were originally validated by Denison and Mishra with case studies and surveys of companies in the United States (Denison & Mishra, 1995). Fey and Denison reduced the Denison survey and administered it to Russian companies. The perception of the culture in Russia is one of a place where teamwork is weak, and individual success is most important. In reality, the research concluded that adaptability and involvement were the key factors for effectiveness in Russia (Fey & Denison, 2003). This current study will look at a textile company's perception of their teamwork culture is associated with their Six Sigma results. Using the same survey developed by Fey and Denison, and adapting parts of the survey for face-to-face interviews, this study will examine a textile company that claims to have "Six Sigma" thinking.

3.1 Quantitative Research: Survey Instrument

In order to receive the appropriate feedback and data that examines company culture and Six Sigma project success, an online survey was conducted through SurveyMonkey. The collection period took place over 12 days. Surveys were distributed via secured email from the researcher's North Carolina State University account in order to protect the anonymity of the survey (Appendix F).

Considering other organizational culture surveys, including different variations of the chosen survey, the survey for this study was drawn from Dr. Carl Fey and Dr. Daniel Denison’s research in “Organizational Culture and Effectiveness: Can American Theory be Applied in Russia?” (2003).

The survey instrument had 50 total questions, including 14 demographic questions and 36 questions on company culture. All 36 questions were statements concerning the company culture factors of involvement, consistency, adaptability, and mission. For each of the 36 questions about company culture, respondents were given a five-point Likert scale, with 1 being strongly disagree and 5 strongly agree. A full copy of the survey can be found in Appendix H.

Table 1: Fey and Denison’s OCSI Traits (2003) Evaluated in Survey

Involvement	Consistency	Adaptability	Mission
<ul style="list-style-type: none"> • Empowerment & Involvement • Teamwork Orientation • Capability Development 	<ul style="list-style-type: none"> • Core Values • Agreement • Coordination & Integration 	<ul style="list-style-type: none"> • Creating Change • Customer Focus • Organizational Learning 	<ul style="list-style-type: none"> • Strategic Direction & Intent • Goals & Objectives • Vision

3.2 Qualitative Research: Face-to-Face Interviews

In addition to the online survey, face-to-face interviews were conducted with three participants who were Six Sigma certified. The survey included a request of participants to further discuss the topic of the survey in interview format. There were no respondents identified based on the survey; therefore, interview participants were chosen from a list of the company's Six Sigma belts and contacted. Based on availability and a desire to stratify the interview results, the participants included a Green Belt, Black Belt and Master Black Belt. The procedure was previously approved by North Carolina State University's Institutional Review Board (IRB) (Appendix C).

Each interview took approximately 30 minutes in a closed room. Prior to the interview, the participants were informed of the purpose of the study and given a consent form to look over (Appendix B). Participants were instructed to signal the interviewer with a nod or verbal permission to participate in the interview.

The interview questions were open-ended questions that covered all four dimensions of Fey and Denison's effective culture components, and three components of each dimension (Appendix H).

3.3 Data Collection and Analysis

Surveys were produced through the online survey tool SurveyMonkey and the link was emailed to participants with a deadline for answering the questions. This method makes the survey easy to access and allows responses to be automatically populated in a

spreadsheet form that can be used by a variety of software. The results of the survey were analyzed using with JMP Statistical software (SAS Institute Inc., 2012).

3.3.1 Sample Selection

The study used criteria from Sharma and Chetiya's (2010) study of Six Sigma project selection to identify a company that practiced Six Sigma. Sharma and Chetiya (2010) found significant factors other than management commitment that contribute to selecting a good Six Sigma project. These factors included "a good communication system, process and workflow management and availability of good metrics and measurement information systems and resources within the organization, in that order" (Sharma & Chetiya, 2010, p. 289). The criteria that Sharma and Chetiya (2010) used to identify valuable companies that practiced Six Sigma were:

- Companies with at least three years of experiencing in implementing Six Sigma
- Companies with executives at least trained as Green and Black Belts
- Companies with a quality management system already in place, i.e. ISO 9001
- Companies that have significant awareness and education about Six Sigma and planned Six Sigma initiatives

The same criterion was used to select a company as a case study for this study. Adhering to these criteria will be key to maintain the scope of this study.

3.3.2 The Company Case Study

Fitting into Sharma and Chetiya's (2010) pattern of Six Sigma driven companies, one textile company was chosen as a case study for this research. The survey and

interview participants of this research were employees who had participated in a Six Sigma project at this company. Employees were identified by upper management and notified of the research taking place.

The chosen company is a textile manufacturing company that specializes in performance textiles for the automotive and specialty markets. One of the company's largest plants is their North Carolina manufacturing plant. The facility is one of the largest vertically integrated textile manufacturing plants in the world. The plant specializes in automotive interior applications and runs 24 hours a day, 7 days a week. The company has strong relationships with major global automakers including BMW, Ford, GM, Honda, Toyota and more. This facility has approximately 625 employees; a list of 26 Six Sigma trained or certified employees was given to the researcher in order to appropriately conduct the research.

One of the company's core pillars is Lean and Six Sigma quality. They seek to involve every employee in the pursuit of Six Sigma quality and increase cost savings not just for themselves, but also for their customers. The majority of the employees at the company are aware of the Lean and Six Sigma methodology, and these practices are visible throughout the organization and manufacturing plant.

CHAPTER 4: RESULTS

4.1 Survey Response Rate

The survey was given to 26 employees identified as Six Sigma certified or trained. There were 25 employees in the beginning, but only 17 employees completed the survey questions. However, some of the 17 respondents did not complete some sections for unknown reason. The 17 - 23 respondents will be noted and analyzed for those appropriate sections of the survey that they completed. The response rate of completed surveys can be seen in Equation 1. The survey participants included 3 females, 16 males and 4 that preferred not to give their gender.

(Total Completed Surveys/Number of Employees Contacted to Complete Survey) x 100

$$(17/26) \times 100$$

$$\text{Response Rate} = 65.38\%$$

Equation 1: Completed Survey Response Rate

4.2 Six Sigma Overview of The Company

The majority of survey participants (Table 2) were Green Belt certified or in the process of getting Green Belt certified at a rate of 68.18%, while Black Belts and Master Black Belts accounted for 18.18% and 9.09% of the participants, respectively. There were 22 respondents for this question; the one missing did answer other questions in the survey.

Table 2: Six Sigma Belt Frequencies

Six Sigma Belts at The Manufacturing Plant			
Belts	Certified	Certification in Progress	Percent Trained or Certified
Green Belt	11	4	68.18
Black Belt	4	0	18.18
Master Black Belt	2	0	9.09
Not Certified	1	0	4.55
TOTAL	18	4	

On average, most of the respondents had worked on either 1 Six Sigma project or 5 or more Six Sigma projects, at 31.8% for each response. Because some of the Belts were working on multiple projects, the subsequent questions asked the participants to refer to the most recent Six Sigma project they participated in. The participants were asked to give the approximate cost savings realized from their last Six Sigma project; 50% of the participants saved approximately \$15,001 - \$75,000 for the company (Figure 1).

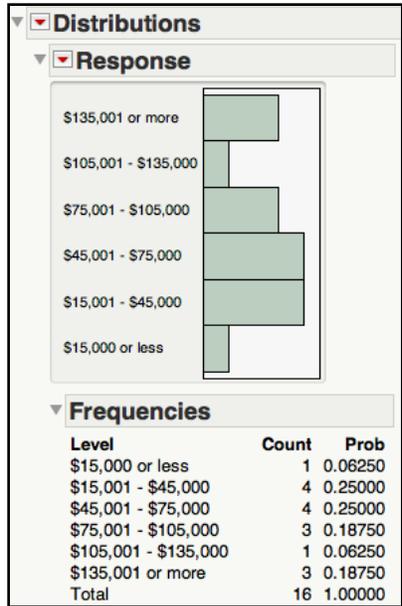


Figure 1: Approximate Six Sigma Project Cost Savings (Most Recent Project)

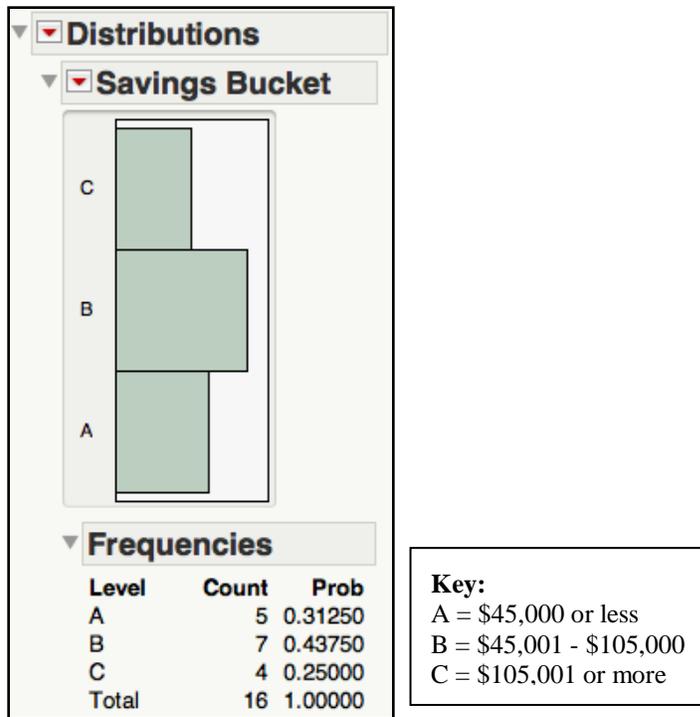


Figure 2: Six Sigma Project Cost Savings Buckets

Next, the participants were asked in open-ended form about their role on their most recent team. The majority of the roles were the project Green Belt, project/team leader, or a project team member (expert, technical lead, team member, data collector, plant controller). Other respondents were the project Black Belt or Champion, and one response was provided that was not relevant to the question. These results support the company's core pillar of quality via Six Sigma methodology and the level of integration throughout the manufacturing plant.

4.3 Culture Component Results

The bulk of the survey evaluated the culture of the North Carolina textile company through the perspective of employees with the company's Six Sigma practice in mind. This portion of the survey contained Fey and Denison's Organizational Culture Survey Instrument (OCSI) with responses being on a 5-point Likert scale from "Strongly Disagree" to "Strongly Agree." In order to analyze the results and gather descriptive statistics, the five responses for each of the questions were assigned a numerical number 1 through 5 respectively. Also, some participants skipped certain portions of the survey for unknown reasons, and the number of participants tapered off towards the end of the survey. The sample size for each portion of the survey will be noted.

4.3.1 Survey Results from the Involvement Component

The Involvement portion of the survey involved subcomponents of empowerment and involvement, team orientation, and capability development. First, with 20 responses of the 23 partially completed surveys, empowerment had mean response for all three questions of 2.55. This mean shows that participants feel that they do not have strong feelings of owning their work, and some are unsure of their ownership. One of the key foundations to a strong positive company culture is the strength of teams and team orientation. The survey revealed that the company's employees did not feel that the company has an emphasis on work done by teams (mean of 2.28). The descriptive results of these three involvement components can be found in Table 3.

Table 3: Involvement Subcomponents and Overall (Q21 – 29)

	N (Number of Participants Responded)	Min	Max	Mean
Empowerment	20	1.00	4.00	2.55
Team Orientation	19	1.00	5.00	2.28
Capability Development	20	1.00	5.00	3.00
Overall Involvement	19	1.00	5.00	2.61

Due to the small sample size, only descriptive statistics were used to analyze the data. In addition, a box-and-whiskers plot was used to just graphically display the sample's median, minimum and maximum. There was not enough statistical significance to draw any statistical inferences from the box-and-whiskers analysis. For involvement by cost savings, the project savings buckets (A = \$45,000 or less; B = \$45,001 - \$105,000; C = \$105,001 or more) realized means of 3.04, 3.03, 2.99 respectively (Figure 3). The medians for the project savings buckets A, B, and C are 2.89, 2.78, and 2.87 respectively.

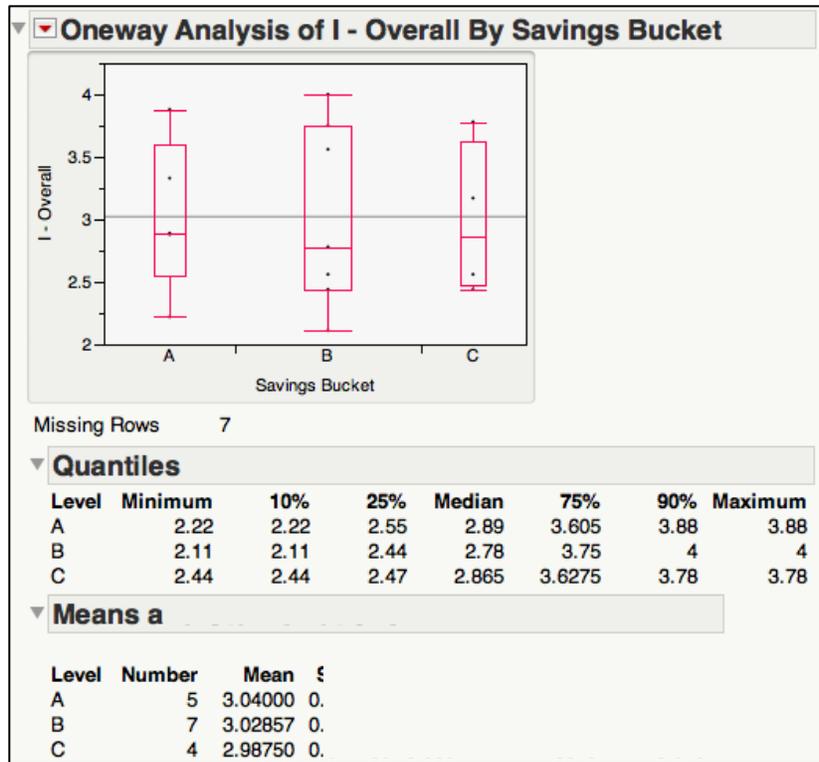


Figure 3: Descriptive Statistics for Involvement by Cost Savings

4.3.2 Survey Results from the Consistency Component

The middle 2 components of the culture portion of the survey included reverse psychology questions. In order to appropriately analyze these components, the responses were reversed where the responses of “strongly disagree” and “disagree” were evaluated as a response of “strongly agree” and “agree” respectively (respective numeric assignments of 1 = 5 and 2 = 4). For consistency, the question of reverse psychology fell under agreement making the statement “We often have trouble reaching agreement on key issues.” The results on agreement found a mean of 2.28, showing that employees feel that

there is some difficulty reaching agreement on key issues. Based on the mean, core values had the highest average of 2.61, giving a sense of that there may be uncertainty among employees as to what the values are for the company. Coordination and integration, meaning the functionality of business units to accomplish tasks, averaged a response of 2.36. Overall, consistency bolstered an average of 2.42, meaning there is disagreement among the employees on the core set of values (Table 4).

Table 4: Consistency Subcomponents and Overall (Q30 – 38)

	N (Number of Participants Responded)	Min	Max	Mean
Core Values	18	1.00	5.00	2.61
Agreement	18	1.00	4.00	2.42/2.28*
Coordination and Integration	18	1.00	5.00	2.36
Overall Consistency	18	1.00	5.00	2.46/2.42*

**adjusted for reverse psychology question*

The descriptive statistics for consistency by cost savings had a grand mean of 3.02. The project savings buckets (A = \$45,000 or less; B = \$45,001 - \$105,000; C = \$105,001 or more) for consistency resulted in means of 3.29, 2.99, and 2.56 respectively (Figure 4). Additionally, the medians for the project savings buckets A, B, and C are 3.33, 3.00, and 2.56 respectively.

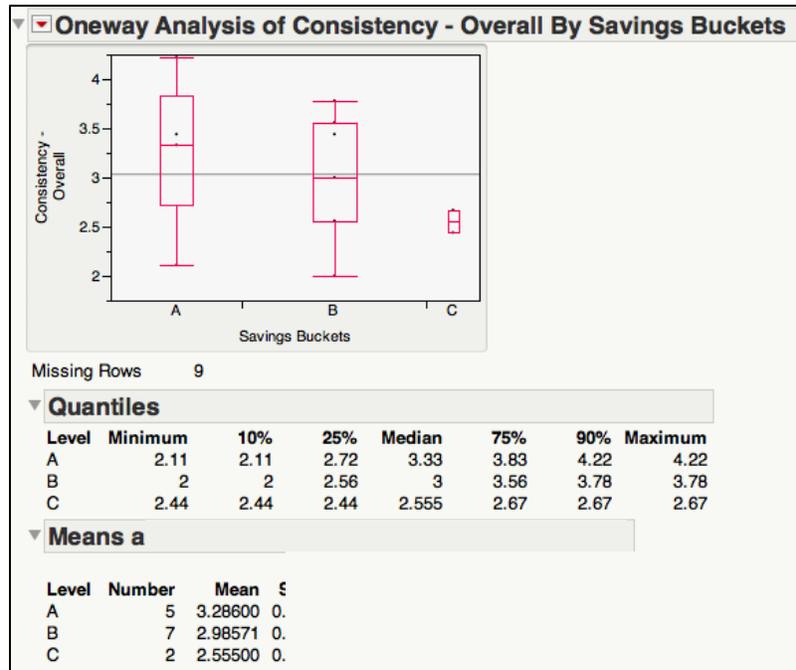


Figure 4: Descriptive Statistics for Consistency by Cost Savings

4.3.3 Survey Results from the Adaptability Component

After respondents completed half of Fey and Denison’s survey instrument, their response rate dropped. The adaptability and mission components had 17 completed responses out of the 23 participants who started the survey. Adaptability had a mean of 2.33 when adjusted for the reverse psychology question, and it consists of the subcomponents: creating change, customer focus, and organizational learning (Table 5: Adaptability Subcomponents and Overall (Q39 – 47)).

Adaptability's reverse statement was "The interests of the final customer often get ignored in our decisions" and the statement was bucketed under customer focus. Thus, the mean for customer focus was 2.39 when substituting the correct numerical values for the responses. Customer focus and organizational learning landed on very close averages with 2.21 and 2.20 respectively, showing that employees do not really believe that the organization is taking the voice of the customers and other environmental pressures and reacting appropriately.

Creating change had similar results with a mean of 2.39, meaning there is a lack of belief in the organization to meet the changing needs of the industry.

Table 5: Adaptability Subcomponents and Overall (Q39 – 47)

	N (Number of Participants Responded)	Min	Max	Mean
Creating Change	17	2.00	5.00	2.39
Customer Focus	17	1.00	4.00	2.21/2.39*
Organizational Learning	17	1.00	5.00	2.20
Overall Adaptability	17	1.00	5.00	2.27/2.33*

**adjusted for reverse psychology question*

The descriptive statistics for adaptability by cost savings had a grand mean of 3.04. The project savings buckets (A = \$45,000 or less; B = \$45,001 - \$105,000; C = \$105,001 or more) for adaptability resulted in means of 3.40, 2.89, 2.62 respectively (Figure 5). The medians for the adaptability project savings buckets A, B, and C are 3.11, 3.06, 2.62 respectively.

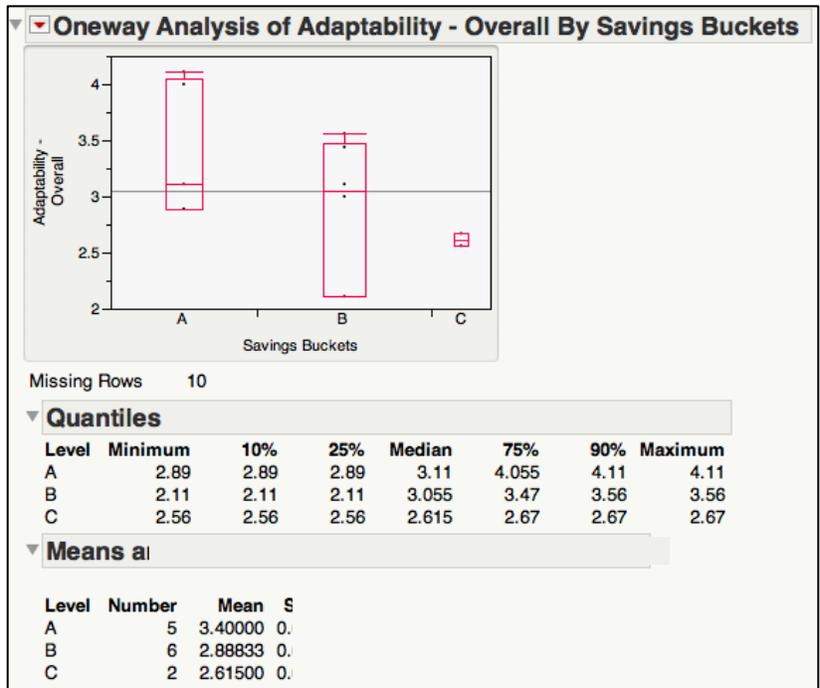


Figure 5: Descriptive Statistics for Adaptability by Cost Savings

4.3.4 Survey Results from the Involvement Component

The last major component, mission, incorporated the following subcomponents: strategic direction and intent, goals and objectives, and vision. Overall, mission had a mean of 2.28, with vision containing the lowest mean, and strategic direction and intent the highest mean (2.03 and 2.45 respectively). In the middle was goals and objectives with a mean of 2.36; this result shows that the goals and objectives may not be clearly linked to the mission of the company. Also, all three components touched on the finding that employees may not be feeling that the mission and vision are parts of their everyday work.

Table 6: Mission Subcomponents and Overall (Q48 – 56)

	N (Number of Participants Responded)	Min	Max	Mean
Strategic Direction and Intent	17	2.00	5.00	2.45
Goals and Objectives	17	1.00	5.00	2.36
Vision	17	1.00	4.00	2.03
Overall Mission	17	1.00	5.00	2.28

The descriptive statistics for mission by cost savings had a grand mean of 3.02. The project savings buckets (A = \$45,000 or less; B = \$45,001 - \$105,000; C = \$105,001 or more) for mission resulted in means of 3.29, 3.07, and 2.17 respectively (Figure 6). In addition, the medians for the project savings buckets A, B, and C are 3.67, 3.17, 2.17 respectively.

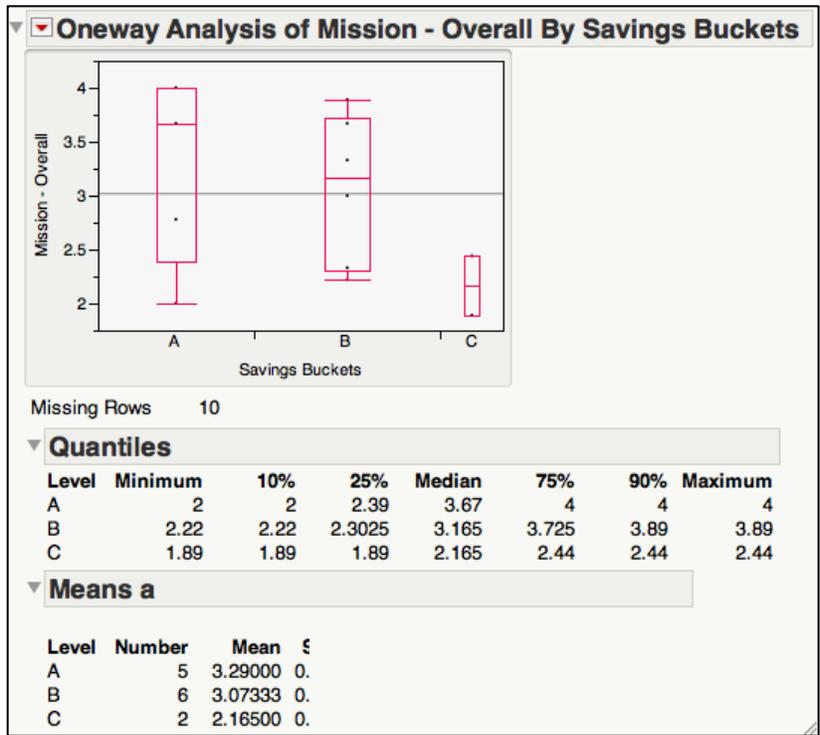


Figure 6: Descriptive Statistics for Mission by Cost Savings

4.4 Interview Reflections

After the survey took place, there were no volunteers to participate in the interview portion of the survey. Three employees were randomly picked from a list provided by upper management at the company, one from each of the three belt levels. The Black Belt and Green Belt contacted agreed to interview, and the Master Black Belt was not able to participate. Thus, another Master Black Belt was randomly chosen and contacted and agreed to be interviewed.

The interviews support the results of the survey despite a tapering off in responses as the survey neared the conclusion. Within all three interviews, the major theme was an

issue with adaptability, mission and involvement. Positives were hard to find in the interviews, which is in concordance with the survey results' means that did not reach "Neither Agree or Disagree." Interview transcripts can be found in Appendix E.

In consensus, all three Belts felt that the goals and vision for the company were "aggressive and challenging" as well as "on point" for the company. Interviewees revealed that issues occurred in the areas of the commitment from leadership and adaptability of the company. The Master Black Belt stated that the vision did not inspire him to do his work because the vision is not realized in the behavior he typically sees from the senior leadership.

The Green Belt had a similar response in our conversation about the core values of the company. He stated that though Six Sigma and "first quality" were one of the pillars of the company, "the management want Six Sigma, but whenever we go out there and we try to do things, they don't want us to follow. They want something done right now...it's like we know we got problems out there, but they just, they want us to do a lot of shortcuts."

The Black Belt believed that the goals and vision of the company had an issue of involvement and adaptability. The Black Belt believed the vision was "spot on," but the "resourcing to achieve the vision is not."

One of the major issues addressed with some mixed response was on the topic of involvement. In particular, within capability development, the Master Black Belt and Black Belt desired improvement in this area, whereas the Green Belt had benefited from the company's former training programs. The Green Belt specifically identified receiving

Microsoft Word, Excel, Powerpoint and Outlook training when he first became an employee of the company. In spite of this, the Master Black Belt believed that the company only invested in developing employees that “push continuing education.” Also, when asked where he would like to the company invest in the employees more, the Master Black Belt believed that they were “in a typically low economic area so anything we can do to enhance the lives or add value to the individual, I think [the company] has a lot of opportunity there.” The Black Belt concluded his interview with a profound statement about the issue of developing employees in stating, “If there’s anything I would say that we are weak at doing, it’s putting those kind of resources in place and giving them the mentoring and coaching and leadership to ensure they are developing and growing and giving this company what it needs in the way of sustainable improvement.”

The adaptability of the company was revealed by the survey results to be lacking. The Green Belt stated even when working on Six Sigma projects and formulating correct data-driven solutions, the employees do not want to change. He said you can show them the data and they will say, “That ain’t right, that ain’t right,” and that “They just don’t want to do it, they just don’t believe it’s going to work, not until you *do* do it and show them that it *will* work.”

In support of organizational learning’s low mean score, failures of the company were clearly stated as setbacks for the company in all three interviews. In response to whether or not the company continually adopts new and improved ways to do work, the Master Black Belt provided a good summary of the low scoring adaptability component

stating that the “Textile industry from my experience in this site, does not adapt to change or innovation very frequently unless forced to.”

4.5 Personal Observations of The Company Culture

The observations are in concurrence with the interviews and the survey results. One of the major issues observed was the commitment from leadership. As stated before, Six Sigma is one of the core pillars of the company and they provided a half-day overview of Six Sigma for all interns. Despite this, within the manufacturing plant, it was observed that Six Sigma projects would be started and then undercut by other leaders with a solution that was not in concordance with the path of the project. Decisions to “stop the bleeding” of defects resulted in “band-aids” temporarily solving problems throughout the plant.

In relation to adaptability, operators on the floor and some leaders were resistant to changes despite the data proving a solution would work. Also, failures in the plant that occurred throughout the 10-week internship were clearly setbacks for the company. Leaders would meet on how to move forward around the issue, but not look at permanently fixing the root cause of the issue. In terms of consistency, disagreements were resolved with arguments with either the loudest person or employee with the most hierarchical power making the final decision.

Lastly, communication across departments within the plant was very difficult to accomplish. Other departments would tend to not respond or would follow through with instructions poorly. There were many teams and team meetings throughout the plant

attempting to resolve issues, but from observation, the team aspect would not leave the meeting, meaning that the completion of team tasks discussed in team meetings involved only one person completing the task. These observations were just a few of what was personally thought to be a poor company culture compared to what literature ascribes (Denison et al., 2006; Sheridan, 1992; Shim & Steers, 2012).

CHAPTER 5: DISCUSSION AND FURTHER IMPLICATIONS

5.1 Discussion and Implications

The research shows that there is a lot in the culture of this textile company with which the employees do not agree. The key issues that had employees disagreeing with statements about the company's culture fell in the components involvement, adaptability and mission. Further, team involvement had the lowest disagreement in involvement. This shows that employees do not feel that the company as a whole works together as a team. In addition, the work being completed by teams may involve a couple of individuals instead of the whole team. The value of teamwork is recognized as one of the most important company culture components in literature and in most companies (Denison *et al.* 2006; Sheridan 1992; Shim & Steers, 2012). With a poor response in teamwork, this is the area that should be addressed by the textile company surveyed. In particular, teamwork building events and activities along with giving more responsibility to the employees and teams for decision-making would be beneficial to the company. In the absence of a sufficient sample size, there was not enough evidence to advocate the value of teamwork for cost savings.

As for adaptability, organizational learning had the lowest disagreeing terms. Organizational learning was the topic that participants disagreed with the most. From discussion in interviews and researcher experience, the failures that occurred in the plant were major setbacks and were not viewed as an opportunity to learn. Additionally, in looking to correct these failures, the communication across the departments was

successful, but the execution of the agreed actions between departments was lacking. In a manufacturing plant, the ability to adapt to constant changes in the environment is vital to the success of any plant. Since the participants indicated issues with the company's ability to adapt to customers' requests or failures, the company should begin investigating ways to better respond to changes. Some may say this comes back to the ability of the company to work in teams to get tasks accomplished. Thus, showing that there are differences in the adaptability of the company to adapt and potential cost savings projects.

In the component of mission, vision was ranked the lowest as the most disagreed upon. As reflected in the interviews, the vision for this textile company does not create excitement or motivate the employees who took the survey. The interviews revealed that the vision is vague and provides very little meaning in the work that is done in this textile company. The company should investigate motivating factors for their employees and thus begin working to improve morale of the company. Reasonably, setting visions and goals that are attainable yet stretch employees would be beneficial to attaining exciting work to be done every day. What separates these brackets of cost savings could be alignment with the objectives and goals of the organization.

Consistency scored "the best" among the four components, but there are still issues within. From the interviews and general observations, one of the major issues that was mentioned was commitment from upper management's following through with what they believed. For example, in regards to respect for others, management would tend to yell at

coworkers about “hot” issues or where they have gone wrong. A better practice would be to calmly confront coworkers about any issues at hand.

Despite being determined as vague by some, the textile company does a great job in making their values clear and consistent. The company practiced having the mission, goals and vision visually placed throughout the plant as observed. These values may not have translated accordingly despite the amount of visibility they received.

Overall, all of the major components researched showed that the textile company surveyed here is in need of improving their overall culture. Accordingly, those individuals who have saved more or less could be correlated to experience with other companies or projects. The company showed a need for improvement in their ability to adapt to the environment around them, align with the core values, and become driven by the company’s mission. Despite this, literature points to the team orientation of a company as a key factor for a positive company culture (Denison et al., 2006; Sheridan, 1992; Shim & Steers, 2012). Therefore, in the best interest of the company, the company should focus improving their culture in the area of involvement.

Suggestions for Companies

Companies should look at investing their time in the areas of involvement, adaptability and mission by reconstructing the mission statement, vision and goals of the company or by making them more visible to employees. As pointed out by literature and these findings, the need for employees to feel involved in teamwork or employee

development and decision-making is key for any successful culture (Denison et al., 2006; Sheridan, 1992; Shim & Steers, 2012).

5.2 Limitations

Barriers to Survey

In conducting this research, there were several barriers that were encountered. First, the textile company was acquired before the study began, but the acquiring company did not make any changes to how the North Carolina manufacturing plant was ran until after the research was complete. This could have negatively or positively affected how the survey participants may have answered the survey questions about the company.

Next, when originally inquiring of the textile company studied in this research, they informed the researcher that there were about 75 to 100 Six Sigma belts to survey. However, upon beginning the survey, the list of Six Sigma belts at the North Carolina manufacturing facility only consisted of 26 trained or certified Six Sigma belts. Despite the small sample size, the high response rate of 65.38% fully completed surveys shows that there was interest from participants to participate in the survey. This reasonably high response rate shows that the survey is relative to what participants believe and want to say (Jin, 2011). If there are more participants asked to participate in the future, then there is a strong possibility of a high survey response rate. In order to account for the 34.62% who did not respond, participant's concerns such as privacy concerns and having no communication with the researcher must be considered; therefore, there is more effort given in interviews over surveys (Jin, 2011).

The methodology of the survey could have been limited as well due to emailing from an outside source. Many companies today have several firewalls and filters for any emails from those not related to the company. Some participants may have never received my email or not have recognized the associated address and ignored the request.

The interviews may have some bias associated with the responses as well. A month after the interviews were completed, at least two of the three interviewees left the company for a similar position at a different company. Both of those candidates had only been in their role for a maximum of one year with this textile company. In addition, the interviewees originally perceived the interview topic to be Six Sigma only and may have geared responses accordingly.

5.3 Further Research

Future research in this area of study could prove to be very valuable to both the quality and organizational culture fields. Forming the appropriate company culture for success does not happen overnight. It is a process within itself that takes several years to “reconstruct” a culture, or to build one. Top management must understand the factors that attribute to a culture that harbors successful Six Sigma projects, and then be the leading examples of those factors. There is no right or wrong answer to how company culture factors should be balanced.

Further studies should include more participants for a company and more Six Sigma projects. In addition, investigating different companies, researchers should look at differences between offices and/or manufacturing plants within the company. The

additional companies should be treated as case studies in case any other theories may emerge from research. Also, future researchers should dive deeper into the relationship that adaptability and involvement have on the Six Sigma projects, as those two components were the ones to score the lowest in this study. Through replication theory, these findings can be supported or provide a new opportunity for research (Eisenhardt, 1989). If a company shows strength in involvement and strong Six Sigma project cost savings, then this would be in support of the findings here and past research. If findings show low involvement scores and poor Six Sigma project savings, then this would also support findings as well.

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APPENDICES

APPENDIX A: IRB Submission Form

**North Carolina State University
Institutional Review Board for the Use of Human Subjects in Research
SUBMISSION FOR NEW STUDIES**

GENERAL INFORMATION

1. Date Submitted: <u>4/19/2013</u>
1a. Revised Date: _____
2. Title of Project: <u>Examining the Relationship Between Company Culture and Six Sigma Project Success</u>
3. Principal Investigator: <u>Kevin Bui</u>
4. Department: <u>Textile and Apparel, Technology and Management</u>
5. Campus Box Number: _____
6. Email: <u>kdbui@ncsu.edu</u>
7. Phone Number: <u>919-623-3856</u>
8. Fax Number: _____
9. Faculty Sponsor Name and Email Address if Student Submission: Dr. <u>Lori Rothenberg, lori_rothenberg@ncsu.edu</u>
10. Source of Funding? (required information): <u>Textile Extension Education for Economic Development</u>
11. Is this research receiving federal funding?: <u>no</u>
12. If Externally funded, include sponsor name and university account number: _____
13. RANK: <input type="checkbox"/> Faculty <input checked="" type="checkbox"/> Student: <input type="checkbox"/> Undergraduate; <input checked="" type="checkbox"/> Masters; or <input type="checkbox"/> PhD <input type="checkbox"/> Other (specify): _____

As the principal investigator, my signature testifies that I have read and understood the University Policy and Procedures for the Use of Human Subjects in Research. I assure the Committee that all procedures performed under this project will be conducted exactly as outlined in the Proposal Narrative and that any modification to this protocol will be submitted to the Committee in the form of an amendment for its approval prior to implementation.

Principal Investigator:

Kevin Bui _____ * 6/7/2012
 (typed/printed name) (signature) (date)

*As the faculty sponsor, my signature testifies that I have reviewed this application thoroughly and will oversee the research in its entirety. I hereby acknowledge my role as the **principal investigator of record**.*

Faculty Sponsor:

Lori Rothenberg _____ * 6/7/2012
 (typed/printed name) (signature) (date)

***Electronic submissions to the IRB are considered signed via an electronic signature. For student submissions this means that the faculty sponsor has reviewed the proposal prior to it being submitted and is copied on the submission.**

Please complete this application and email as an attachment to:
debra_paxton@ncsu.edu or send by mail to: Institutional Review Board, Box 7514,
NCSU Campus (Administrative Services III). **Please include consent forms and other
study documents with your application and submit as one document.**

For SPARCS office use only

Reviewer Decision (Expedited or Exempt Review)

Exempt Approved Approved pending modifications Table

Expedited Review Category: 1 2 3 4 5 6 7 8a
8b 8c 9

Reviewer Name

Signature

Date

**North Carolina State University
Institutional Review Board for the Use of Human Subjects in Research
GUIDELINES FOR A PROPOSAL NARRATIVE**

In your narrative, address each of the topics outlined below. Every application for IRB review must contain a proposal narrative, and failure to follow these directions will result in delays in reviewing/processing the protocol.

A. INTRODUCTION

1. Briefly describe in lay language the purpose of the proposed research and why it is important.

Very little quantitative research has been done on company culture in the context of quality improvement teams. The purpose of the proposed research is to examine the relationship between the culture of a company and the success of quality improvement projects. To properly scope the project, the investigation will be held at the level of Six Sigma quality improvement project teams; members of these teams will be asked to participate in the study. This research is important as it will reveal how an employee's work environment is related to their work on projects for the company. The result of this research could lead to recommendations on how much time and money should be invested in the shaping of a company's culture.

2. If student research, indicate whether for a course, thesis, dissertation, or independent research.

This is student research for a thesis required for completion of a Masters of Science in Textiles degree.

B. SUBJECT POPULATION

1. How many subjects will be involved in the research?

Estimates or ranges are acceptable. Please be aware that if you recruit over 10% more participants than originally requested, you will need to submit a request to modify your recruitment numbers.

100 subjects will be surveyed, including 3-5 subjects will be interviewed for qualitative purposes

2. Describe how subjects will be recruited. Please provide the IRB with any recruitment materials that will be used.

The Continuous Improvement department for Guilford Performance Textiles will assist Kevin Bui in identifying employees that have participated in Six Sigma projects for the company. These employees can have any level of Six Sigma training (Green Belt, Black Belt, Master Black Belt). After those employees have been identified, Human Resources will assist Kevin in emailing out the survey instrument through Kevin Bui's NCSU email account to employee's work email accounts.

3. List specific eligibility requirements for subjects (or describe screening procedures), including those criteria that would exclude otherwise acceptable subjects.

Subjects will be required to have participated in or currently participating in a Six Sigma project with Guilford Performance Textiles, at the Green Belt level or higher.

4. Explain any sampling procedure that might exclude specific populations.

This sampling procedure may exclude those who have been on other types of quality improvement projects, such as a Lean project. Guilford Performance Textiles is a company that embraces two types of quality improvement; the one being researched is Six Sigma, the other Lean. Both are equally important to the company. Due to the depth that Six Sigma already provides, Lean project members will be excluded from this study. Also, the sampling may exclude any employees who are Six Sigma trained, but have not participated in a Six Sigma project at Guilford Performance Textiles.

5. Disclose any relationship between researcher and subjects - such as, teacher/student; employer/employee.

Researcher: employee – summer intern
Subjects: employees – full-time co-workers of Guilford Performance Textiles – Kenansville, NC Plant

6. Check any vulnerable populations included in study:

- minors (under age 18) - if so, have you included a line on the consent form for the parent/guardian signature
- fetuses
- pregnant women
- persons with mental, psychiatric or emotional disabilities
- persons with physical disabilities
- economically or educationally disadvantaged
- prisoners
- elderly
- students from a class taught by principal investigator
- other vulnerable population.

7. If any of the above are used, state the necessity for doing so. Please indicate the approximate age range of the minors to be involved.

C. PROCEDURES TO BE FOLLOWED

1. In lay language, describe completely all procedures to be followed during the course of the experimentation. Provide sufficient detail so that the Committee is able to assess potential risks to human subjects. In order for the IRB to completely understand the experience of the subjects in your project, please provide a detailed outline of everything subjects will experience as a result of participating in your project. Please be specific and include information on all aspects of the research, through subject recruitment and ending when the subject's role in the project is complete. All descriptions should include the informed consent process, interactions between the subjects and the researcher, and any tasks, tests, etc. that involve subjects. If the project involves more than one group of subjects (e.g. teachers and students, employees and supervisors), please make sure to provide descriptions for each subject group.

1. Ask for permission from proper management authorities at Guilford Performance Textiles to survey employees that have been involved with Six Sigma projects at the company.
2. Request a full listing from Continuous Improvement of those employees and their work emails that have participated in Six Sigma projects.
3. Send email containing a summary of the study and link to the survey from Kevin Bui's NCSU email account, to the 100 employees with the most recent project experience. Survey (Attached at end of this form) will have 46 questions and should take approximately 15 minutes to complete
 - Responses for 36 questions will be a 5 point Likert scale
 - Remaining 10 questions will be for demographic and classification purposes
4. As soon as the survey is submitted, the responses are stored on SurveyMonkey's server under NCSU Textile Extension Education's account and the participant will be done with their portion of the project
5. The survey will conclude with a statement to contact Kevin Bui at his NCSU email account if they are willing to further discuss the topics in the survey. The interviews of those who wish to discuss their thoughts further will not be linked with their surveyed responses.
6. If there are no volunteers for the interview through the survey, a separate email will be sent out through Kevin Bui's NCSU email account asking for volunteers to interview.
7. Perform 30-minute face-to-face individual interviews with 3 – 5 employees who have participated on Six Sigma projects. (Interview questions attached at end of form).
8. Respondents will be given one month to complete the survey, given the fact that many employees will be out on vacation. Two reminder emails will be sent.
9. Upon completion of survey research, surveys will be destroyed and a spreadsheet of the responses will only be kept.
10. Interviews will be electronically transcribed and the tape will be destroyed.
11. Summary of results will be made in aggregate form to top managers and Human Resources of Guilford Performance Textiles upon completion of the research (tentative January 2013). As well as Denison Research, as required in accepted use of their survey.

2. How much time will be required of each subject?

Approximately 15 minutes per online survey
 Approximately 20-30 minutes per interviews

D. POTENTIAL RISKS

1. State the potential risks (psychological, social, physical, financial, legal or other) connected with the proposed procedures and explain the steps taken to minimize these risks.

Social risk: Survey will call for subjects to be honest about the company's management and coworkers – To minimize this risk, subjects will be notified that responses from each subject will be kept anonymous, confidential and not shared with anyone but the Principal Investigator and Faculty Advisor. Also, subjects will be notified that a written summary will be given to management with direct quotes, and there will be no reference that could link them to this study.

2. Will there be a request for information that subjects might consider to be personal or sensitive (e.g. private behavior, economic status, sexual issues, religious beliefs, or other

matters that if made public might impair their self-esteem or reputation or could reasonably place the subjects at risk of criminal or civil liability)?

No

a. If yes, please describe and explain the steps taken to minimize these risks.

3. Could any of the study procedures produce stress or anxiety, or be considered offensive, threatening, or degrading? If yes, please describe why they are important and what arrangements have been made for handling an emotional reaction from the subject.

No

4. How will data be recorded and stored?

Data from the survey will be recorded on SurveyMonkey.com and will be stored on SurveyMonkey's servers. The SurveyMonkey account belongs to NCSU Textile Extension Education. Upon completion of data collection, the survey responses will be exported on a spreadsheet as a Microsoft Excel file and the survey on SurveyMonkey will be deleted permanently. After analysis of the responses is complete, the data will be deleted from every location, and only one copy will be stored on a personal password protected home external hard drive.

There will be no video recording. Interviews will be captured by hand written notes or audio recording. Information captured during interviews will be transcribed into electronic text by researchers. The transcribed interviews will be stored on Kevin's secured computer. The original hand written notes and audio recordings will be destroyed (hand written notes will be shredded and voice recordings permanently deleted from the memory) as soon as they are transcribed.

a. How will identifiers be used in study notes and other materials?

There is no plan to ask for individuals' names in the administering of the survey. Further, once the survey from a participant is submitted, those responses will be assigned a participant number based on order of submission.

There is no plan to include individuals' names in the transcriptions of the interviews. Interview participants' names will not be recorded, but their job title and coded identifier may be noted. There are enough people in different departments and titles so that no one person should be identified by a job title.

b. How will reports will be written, in aggregate terms, or will individual responses be described?

Reports will be written to summarize the whole sample in a thesis and there will be quotes from the interviews but they will not be ascribed to a person.

5. If audio or video recordings are collected, will you retain or destroy the recordings? How will recordings be stored during the project and after, as per your destruction/retention plans?

Audio recordings will be recorded for 3-5 interviews will be stored in the researcher's personal locked safety box at his home. Audio recordings will be erased after completing the transcription of its contents.

- 6. Is there any deception of the human subjects involved in this study? If yes, please describe why it is necessary and describe the debriefing procedures that have been arranged.

No deception.

E. POTENTIAL BENEFITS

This does not include any form of compensation for participation.

- 1. What, if any, direct benefit is to be gained by the subject? If no direct benefit is expected, but indirect benefit may be expected (knowledge may be gained that could help others), please explain.

There are no direct benefits from this study by the subject. Indirectly, as a result of the study, managers of the company can better evaluate and shape the culture of the company to improve the success of Six Sigma projects.

F. COMPENSATION

Please keep in mind that the logistics of providing compensation to your subjects (e.g., if your business office requires names of subjects who received compensation) may compromise anonymity or complicate confidentiality protections. If, while arranging for subject compensation, you must make changes to the anonymity or confidentiality provisions for your research, you must contact the IRB office prior to implementing those changes.

- 1. Describe compensation

There is no compensation.

- 2. Explain compensation provisions if the subject withdraws prior to completion of the study.

n/a

- 3. If class credit will be given, list the amount and alternative ways to earn the same amount of credit.

There is no class credit.

G COLLABORATORS

- 1. If you anticipate that additional investigators (other than those named on **Cover Page**) may be involved in this research, list them here indicating their institution, department and phone number.

Lori Rothenberg, College of Textiles (919-513-1597)

- 2. Will anyone besides the PI or the research team have access to the data (including completed surveys) from the moment they are collected until they are destroyed.

No.

H. CONFLICT OF INTEREST

1. Do you have a significant financial interest or other conflict of interest in the sponsor of this project? No
2. Does your current conflicts of interest management plan include this relationship and is it being properly followed? No

I. ADDITIONAL INFORMATION

1. If a questionnaire, survey or interview instrument is to be used, attach a copy to this proposal.
2. Attach a copy of the informed consent form to this proposal.
3. Please provide any additional materials that may aid the IRB in making its decision.

J. HUMAN SUBJECT ETHICS TRAINING

*Please consider taking the [Collaborative Institutional Training Initiative](#) (CITI), a free, comprehensive ethics training program for researchers conducting research with human subjects. Just click on the underlined link.

APPENDIX B: IRB Consent Form

North Carolina State University
INTERVIEW INFORMED CONSENT FORM for RESEARCH
This consent information is valid June 22, 2012 through June 22, 2013

Title of Study: Examining the Relationship Between Company Culture and Six Sigma Project Success

Principal Investigator: Kevin Bui
Rothenberg

Faculty Sponsor (if applicable): Dr. Lori

What are some general things you should know about research studies?

You are being asked to take part in a research study. Your participation in this study is voluntary. You have the right to be a part of this study, to choose not to participate or to stop participating at any time without penalty. The purpose of research studies is to gain a better understanding of a certain topic or issue. You are not guaranteed any personal benefits from being in a study. Research studies also may pose risks to those that participate. In this consent form you will find specific details about the research in which you are being asked to participate. If you do not understand something in this form it is your right to ask the researcher for clarification or more information. A copy of this consent form will be provided to you. If at any time you have questions about your participation, do not hesitate to contact the researcher(s) named above.

What is the purpose of this study?

Very little quantitative research has been done on company culture in the context of quality improvement teams. The purpose of the proposed research is to examine the relationship between the culture of a company and the success of quality improvement projects. To properly scope the project, the investigation will be held at the level of Six Sigma quality improvement project teams, members of these teams will be asked to participate in the study. This research is important as it will reveal how an employee's work environment is related to their work on projects for the company. The result of this research could lead to recommendations on how much time and money should be invested in the shaping of a company's culture.

What will happen if you take part in the study?

You have received this fact sheet through an email originated from Kevin Bui's NC State University email account, Principal Investigator of this project. Attached to this email are some of the basic and common questions on this project as well as characteristics of the nature of our interview. Kevin Bui, will contact you and arrange for the interview at Guilford Performance Textiles. If you agree to participate, you will be asked to participate in an audio-taped interview lasting up to 30 minutes. This interview will be transcribed and the audio recording will be destroyed. A final report of the study will be given to Guilford Performance Textiles. Direct quotes from the interview may be used in reports, but no reference will be made in these reports which could link you to the study.

Risks

As a subject to of this study, there may be some discomfort in honestly evaluating management and coworkers during the interview. Due to the nature of this interview, all responses for each individual's response will be kept confidential. Only Kevin Bui, Principal Investigator, and his faculty sponsor, Dr. Lori Rothenberg, will have access to the responses. A written report will be given to Guilford Performance Textiles and may include direct quotes from the interview, but no reference will be made that could link you to this study.

Benefits

There are no direct benefits from this study by the subject. Indirectly, as a result of the study, managers of the company could better evaluate and shape the culture of the company to improve the success of Six Sigma projects.

Confidentiality

The information in the study records will be kept confidential to the full extent allowed by law. Audiotapes of the interview will be stored in the Principal Investigator's combination lock safe. Audiotapes will be destroyed after transcription. Your position title may need to be referenced in order to explain how a person in your position is or has experienced culture. Direct quotes may be used in oral or written reports, but no reference will be made in these reports which could link you to the study. While the researcher will take measures to protect your identity, colleagues may be able to identify you in reports based on your interview responses.

Compensation

You will not receive anything for participating.

Participation in this study is not a requirement of your employment at Guilford Performance Textiles, and your participation or lack thereof, will not affect your job.

What if you have questions about this study?

If you have questions at any time about the study or the procedures, you may contact the researcher, Kevin Bui, at kdbui@ncsu.edu, or (919)-623-3856 or his faculty advisor, Dr. Lori Rothenberg at (919)521-1356, or lfrothen@ncsu.edu.

What if you have questions about your rights as a research participant?

If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact Deb Paxton, Regulatory Compliance Administrator, Box 7514, NCSU Campus (919/515-4514).

Consent To Participate

"I have read and understand the above information. I have received a copy of this form. I agree to participate in this study with the understanding that I may choose not to participate or to stop participating at any time without penalty or loss of benefits to which I am otherwise entitled."

If you agree to participate, please indicate your willingness to the researcher and s/he will begin the interview.

APPENDIX C: IRB Approval

NC STATE UNIVERSITY

Campus Box 7514
Raleigh, North Carolina 27695-7514

919.515.2444 (phone)
919.515.7721 (fax)

success

From: Deb Paxton, IRB Administrator
North Carolina State University
Institutional Review Board

Date: June 22, 2012

Title: Examining the relationship between company culture and six sigma project

IRB#: 2695

Dear Mr. Bui,

The project listed above has been reviewed by the NC State Institutional Review Board for the Use of Human Subjects in Research, and is approved for one year. **This protocol will expire on June 22, 2013 and will need continuing review before that date.**

NOTE:

1. You must use the attached consent forms which have the approval and expiration dates of your study.
2. This board complies with requirements found in Title 45 part 46 of The Code of Federal Regulations. For NCSU the Assurance Number is: FWA00003429.
3. Any changes to the protocol and supporting documents must be submitted and approved by the IRB prior to implementation.
4. If any unanticipated problems occur, they must be reported to the IRB office within 5 business days by completing and submitting the unanticipated problem form on the IRB website.
5. Your approval for this study lasts for one year from the review date. If your study extends beyond that time, including data analysis, you must obtain continuing review from the IRB.

Sincerely,



Deb Paxton NC State IRB

APPENDIX D: Interview Outline

COMPANY CULTURE – INTERVIEW QUESTIONS

Involvement

1. How are decisions made?
 - a. Would you say that is at the level where information is best available?
2. Describe the role of teams in the company.
 - a. Does this company continuously invest in the skills of employees? [Prompt: Like providing training, conferences, or mentoring at no cost to you individually?]
 - b. If yes, how and what have you gained from this? (Prompt: What kind of conference, training, mentoring?)
 - c. If no, where would you like to see this company invest in it's employee's skills more?

Consistency

1. Do you believe the leaders and managers follow the guidelines that they set for the rest of the company?
 - a. Yes, give an example
 - b. If not, what is one guideline that you feel that has not been followed by leaders and managers?
2. How often does your team or business unit have trouble reaching agreement on key issues?
 - a. How are disagreements resolved?
3. How do you coordinate projects across the functional units/departments in this company?
 - a. How long does this typically take?

Adaptability

1. How does this company continually adopt new and improved ways to do work?
 - a. What are some new and improved ways?
2. How often does Feedback from customers lead to changes in this company?
 - a. Examples?
3. How is failure handled at this company?
 - a. [Prompt: is it viewed as a setback or an opportunity to learn and improve?]

Mission

1. What is the mission of this company?
 - a. Do you feel that this mission is clear and gives meaning and direction to the work you do? Why or why not?
2. What are some of the goals set by the leaders of this company?
 - a. What do you think of the goals?
3. Does the vision of this company motivate and excite you to do your work? Why or why not?

APPENDIX E: Interview Questions and Responses

Interview Transcript

Jimmy Miller, GB, Continuous Improvement

K: This is the first interview of Kevin Bui's Thesis Research Survey, I am the investigator, and today is...July 23rd, it is 2:18pm, and I am about to interview Jimmy Miller.

If you could just say your name, and what belt you are in Six Sigma. If you are certified, and if not what belt you are pursuing to be certified in.

J: My name is Jimmy Miller, and I am currently right now a Green Belt

K: Are you seeking to become Black Belt certified?

J: Yes.

K: How many Six Sigma projects have you participated in at [Company Name]?

J: I work full time as a Green Belt, I've been a full time Green Belt off and on, probably about 5 years. I have completed...um...probably 5 projects...um...and I've also been involved in several different projects with other Black Belts that's been with the company

K: How many team members were on the last Six Sigma project you were involved in?

J: The one that, that I ran?

K: mhm

J: Probably 6 team members. Probably.

K: Ok. You were the Green Belt for that last project, correct?

J: Yeah

K: What were the approximate cost savings realized from the last project you were on?

J: Probably around \$50,000 [annually]

K: Are you allowed...could you disclose the name of that project?

J: Well, I currently have 2 that I am working on right now, and I'm tracking the savings on them. Um...So you want to know...

K: Just like the name or the problem statement of the project would be great as well

J: The one before the on I'm doing right now is probably...Nonwoven backing usage.

K: Now we are going to start the interview questions. Alright, my first question is: Do you believe the leaders and managers follow the guidelines that they set for the rest of the company? Here at [Company Name]? And if so, give an example of that.

J: Um, what was that now?

K: ok, we will just start with yes or no. Do you believe the leaders and managers, here at [Company Name], follow the guidelines that they set for the rest of the company?

J: Uh...Not always.

K: What is one guideline that you feel that has not always been followed by the leaders and managers here at [Company Name]?

J: Well like, Six Sigma, you know we've been told that, they're trying to push Six Sigma, stuff like that, but I, through some of the management I don't really see it.

K: Can you give more? Like an example of, how you don't see it? Or how they try to push it, but then don't follow through with pushing Six Sigma?...Or why you feel that way? I guess in a more detailed example, lets say, one of the leaders. I'm not going to...I don't think I'm allowed to say names, one of the leaders says "We really want Six Sigma, we need to get more Six Sigma projects out there." He's really passionate about it, but nothing gets done.

J: But a lot of stuff I see with the management, and stuff, is they say they want Six Sigma, but whenever we go out there and we try to do things. They don't want us to follow the...they want something done right now...and with Six Sigma you got steps you got to take and go through, but it's like we know we got problems out there, but they just, they want us to do a lot of shortcuts, just got out there and just fix it, just do it you know? Versus going through everything that needs to be done.

[BREAK DUE TO INTERRUPTION FROM BRAD BERTHOLF COMING IN AND GRABBING EQUIPMENT]

K: Continuing with Jimmy Miller's interview after a brief interruption. So you were saying that, the management wants Six Sigma, but they have a "right now" mentality and like to take shortcuts instead and that's how you feel about the belief of the leaders and managers to follow the guidelines that they set for the rest of the company. If you don't mind, we are going to expand on the real quick, outside of Six Sigma, are there other guidelines that they have and that they try to set for the rest of the company and do you believe that they set, that they follow through with those guidelines.

J: ...I guess.

K: Ok that's fine. The next question is: Do you know the mission of this company, of [Company Name]?

J: The mission of this company?

K: mhm

J: As for as...yeah, no defects, first quality.

K: Do you feel that this mission is clear and gives meaning and direction to the work you do?

J: Yeah

K: Why do you feel that mission is enough or that it gives meaning to the work that you do?

J: They mention it, they mention to us enough and we have associate meetings and they show us our quality, and...how we're performing and stuff like that, and keep us update and...stuff like that

K: Describe the role of team in this company, not just Six Sigma, but any team aspects that they have here at [Company Name], are they, would you say that they are important to the company, or they not that important?

J: You mean like process techs, and lean and stuff like that?

K: Yeah, just teams, or any kind of team formation, it could be like I guess the group of operators like shift 1 operators or shift 2 operators, or all the process techs as a team, any grouping at all, even like Six Sigma teams

J: Yeah I think it's a good think if they put them all working on the things that need to be worked on

K: Does this company continuous, would you say, does this company continuously invest in the skills of the employees like providing training for the employees, going, sending them to conferences, or mentoring you at no cost to you at all

J: Yeah

K: How and what have you gained from the training, mentoring or conferences?

J: What have I gained in it?

K: Let's say what's one training session that you have been to here at [Company Name], that they have provided for you?

J: Well when I first started this position, I been through an Excel class, a Word class, a Powerpoint class, stuff like that, that would help me better at my job.

K: So kind of like a Microsoft class in general, basic computer skills, and so that's helped you perform better at your job currently. How about, have they sent you to any kind of conferences before?

J: No

K: How about setup mentoring for you within the company?

J: What do you mean mentoring?

K: Like someone to oversee you, walk you through just working here at [Company Name], getting to know you better, or helping you with a project, or helping you with your work

J: None other than the Black Belts we've had out here that's been over me

K: Is there any area that you would like to see [Company Name] invest in it's employee's skills more? Like more training sessions, sending you guys to certain conferences to help build your skills. Or providing more mentors, lets say not just in the Six Sigma group, but lets say, like process techs having a mentor?

J: I don't know

K: That's fine. Let's see here. How often does Feedback from customers lead to changes in the company?

J: You talking about the customer that we sell our fabric to?

K: mhm

J: How often?

K: In Six Sigma terms, how often does [Company Name] go get the Voice of the Customer and see what they want from you guys, lets say they come across a defect, how often does that, not necessarily a defect, but even other things, but change how this company might be ran, how things might be operated here?

J: We have a...uh...I can't think of the name of what it is. Defects keep getting out to the customer whatever, the customer requires a...it's a sheet they fill out...I can't think of what the name of what it is now, but it has to be filled out and I think *mistaken* gets sent back to the customer to see what we found. Like if say picks get out, keep getting out to the customer, they have to fill this out, do the 5 whys on it and stuff like that. And find out what the root cause is to happened and what they put in place for it to not happen no more, and then that gets, *mistaken* gets sent back to the customer. So we have that in place.

K: So [Company Name] has to fill out that form, or does the customer?

J: [Company Name] does.

K: So that's a good example, how is failure handled at this company, at [Company Name]? Is it viewed as a setback or an opportunity to learn and improve?

J: A failure?

K: Yeah, how is it handled here?

J: It's probably out the door [LAUGHS]

K: Out the door? [LAUGHS]

J: Failure like?...I've seen black belts come here, and Black Belts they have so much a year they have to have in savings and if they don't meet their savings then...they're gone

K: How about something like an operational failure that happened last week, Frame 6, the chain just completely went out from under, is that viewed as an opportunity for improvement or is that a complete setback?

J: Probably a setback.

K: Okay. Or an another example, lets say flame lamination, I don't know the process for it completely, but it doesn't get processed through the flame lam fast enough, enough yards. Let's say Toyota puts in an order for it, and [Company Name] can't do enough yards for it consistently over several months. Since that's a failure since we can't meet the customer's needs, is that a failure viewed as a setback or opportunity to improve?

J: Well, it should be an opportunity to improve, but I think, a lot of the stuff, whoever is telling the customers we can get this, I think they just telling them that so we can get their business, and not going on what we can actually produce, and then ship out to our customer

K: How often does your team or business unit, so how often does, I guess C.I., Continuous Improvement, have trouble reaching agreement on key issues? Or your Six Sigma teams, how often do they have trouble reaching agreement on key issues?

J: Reaching agreements with the issues? Which issues?

K: Let's say your team can't agree on critical x's for the project or can't agree on the actual financial outcome of the project or the defects

J: My team pretty much agrees on everything, if we can't agree, we pretty much decide why and then, usually we're pretty good about agreeing on stuff

K: So it's pretty easy for you guys to reach an agreement on most things. If disagreements do occur, how are they resolved?

J: We just talk through it and see, get each one's opinions on why. And just go from there

K: How are decisions made in this company?

J: How are decisions made?

K: Yeah. An example of that would be, as a team...all of the top level managers, site director, the operations leader, all of the managers...or is 1 person overriding all the decision in the end

J: I'd say at the end probably 1 person

K: Could you, would you be willing to give the title of that 1 person that kind of makes the ultimate decision?

J: I'd probably say Kevin Kernan [VP of NA and Asia OPS] or Royal [Smith – Site Director]. I mean if there's something said, if there's a project we want to work on that we think is good. If they see it and they don't think it's worth it, they can say "I don't think that's a good project to work on" so they can shoot it down, then you got to find something else

K: Would you say that this is at the level where information is best available? Meaning they know the most so they have the authority or is it better to, or would you think its better for a team, like all the managers on the floor to get together and make a group decision?

J: Oh, I'd think it be better for a team and a group decision to make decisions, instead of just one person

K: Do you think that, that's because that's where the managers know the most information about what's going on in the plant? And the defects, per say, for a project?

J: Um, it could be on certain things.

K: Ok. How does this company continually adopt new and improved ways to do work?

J: How do they continue to...?

K: So I guess my first question would be, do they continue to adopt new ways to do work in this company?

J: ...

K: Do you need an example?

J: yeah

K: Kind of like when, if a company is just starting out per say, and they need a quality management system they'll think "oh we need something like Six Sigma" so they'll begin to adopt that methodology and do it. Or they need better safety and adopt something like STOP cards like they have here. So is, with [Company Name], do they continue to adopt new systems to better improve where they're at?

J: Yeah, yeah I think so.

K: Do you have any examples of new and improved ways?

J: Well we have a thing...um...my minds going blank right now...say UK or Pine Grove if they implement something or whatever, then we relate it back over here to see if we can use it over here. Say like if I'm working a project with narrow width or something. We get up with Pine Grove or UK to see if, their cut plants are having any of the same issues and let them know what

we're doing to fix our problem, and they can probably use the same thing over there and vice versa. If they got something, we'll use it over here too, to help this plant.

K: So that leads me, how often, how do you coordinate projects across different departments in [Company Name]?

J: How do we determine what projects to work on and...

K: When you're working on a project, how do you guys coordinate working together between departments? Is it by email, face-to-face, structured meetings...

J: You talking about just in the plant here?

K: Yes just in the plant here.

J: I'd say emails and face-to-face and meetings

K: So, I guess, how long does it take to coordinate or getting a project together across different departments to work on it if you need different departments.

J: You talk about like get a team together?...Probably a few days, a couple of days...Cause they have to find out whose the best resource that they have that they can give us.

K: What are some of the goals set by the leaders of this company?

J: What some of the goals?

K: Yeah

J: 1st Quality...On-time delivery

K: What do you think about these goals? Are they good goals for the company or if you were in charge, would you change the goals a little bit.

J: I think they're good. We need to get our product out to our customer on time, but we don't need to, I don't think we need to push it, and have defects in it, we need to slow down and got it out right, everything's right the first time.

K: ok that's good. That ends the interview, it is 2:44. And thanks Jimmy!

Interview Transcript

Arnold Lynch, BB, Knitting/Warping/Weaving Department Manager

K: Today is July 31st, its 3:10pm, and I'll be interviewing Arnold Lynch, and I'll just start with a couple basic questions. What is your name?

A: Arnold Lynch

K: What Six Sigma belt, have you been certified for or in the progress of receiving certification for?

A: Black Belt certified, March 2009

K: Awesome. How long have you been working at [Company Name].

A: 1 year

K: How many Six Sigma projects have you participated in at [Company Name]?

A: 2

K: How many team members were on the last Six Sigma project you were involved with?

A: Other than the Black Belt?

K: Include the Black Belt

A: 5

K: What was your role on that project you participated in?

A: I was the department manager responsible for implementing, and control, implementing the project and controlling the solution

K: What were the approximate cost savings realized from that last Six Sigma project you participated in?

A: Gosh Kevin, I...I want to say somewhere in the neighborhood of \$40 to \$50 thousand dollars annualized. That's just a guess...I don't have the figures...

K: That's perfect. I missed a question, where were you certified at?

A: Nortel Networks, Raleigh, North Carolina

K: I will begin the interview questions. I guess the ones I'm looking at in particular. What is the mission of [Company Name]?

A: [Company Name]'s mission?

K: [Company Name]'s mission.

A: To be the world's leading automotive textile supplier...um...key leadership attributes and...making that a success and certainly, with leveraging and practicing Six Sigma discipline. I wish I could quote the mission statement, but I don't have it at my fingertips.

K: That's fine. Do you feel that this mission is clear and gives meaning to the work you do? Why or why not?

A: It's certainly repeated often enough, and I think it is...certainly practiced in the drive and ambition of our leadership team. The Six Sigma discipline part...I guess we'll get into that as we go

K: Do you feel that it gives meaning and direction to the work you do? The mission that [Company Name] has laid out for the entire company?

A: Does it give meaning to the work I do...um I don't think about it every day, if that's what you're saying

K: Yeah kind of

A: It's certainly intertwined in what we do, but it's not something I come in whistling everyday

K: Um my next question is: What are some of the goals set by the leaders of this company?

A: Safety first. Quality second. Productivity third. That message is very clearly and consistently practiced so we take care of our people first and foremost, then we make sure we produce a good quality product by very quickly containing anything that we see that's...well first to be preventative in eliminating quality in the first place, and if we see a defect, we contain it as quickly as possible...and we..We do have some very good tools and push to make sure we're solving the right problem...um...in trying to get to the root cause and make sure we got the solution in place that makes that go away. Certainly last but not least, productivity, we have to produce...the product needed to earn the hours and dollars we invest into producing that product, if not we are not going to be here

K: What do you think about these goals that the leaders set? Are they good goals or would you change them?

A: No, I wouldn't change them they're the right goals and the right priorities

K: Does the vision of [Company Name] excite you to do your work, why or why not?

A: Does the vision of [Company Name]...

K: So like if you take the mission statement, does it motivate and excite you, it's kind of almost the same question, but

A: Not necessarily.

K: Why or why not? I guess why not?

A: Now again, we talked about vision vs. mission statement, those are 2 things. The mission statement is...it's a lot of words that basically say we are going to be the best. I think the vision is spot on, I think the resourcing to achieve the vision is not.

K: That's great thank you. Sorry I forgot to mention one thing I just thought of it, just so you know this is being recorded, I guess you've noticed, but I will transcribe all of this into Microsoft Word, this recorder is locked up at my apartment when I go home. After I transcribe it to Microsoft Word, I will delete all the audio files according the thesis...sorry I forgot all that

A: Okay.

K: My next question is: How does [Company Name] continually adopt new and improved ways to do work? And what are some of the new and improved ways you have seen recently.

A: I think [Company Name] has a..um..a..a very good best practice...discipline, at least at the leadership level, they really promote looking across business for best practice ideas and finding ways to implement those so we can continue to learn from other sites that may have found a new and better way to do something that we are still struggling to do, or that we can certainly do better and we have no idea. So the best practice push is...is very good. The...um...some of the tools that we have at our disposal...such as the 8D approach and just using the fishbone approach, Ishikawa diagram, just to kind of make sure we're getting to root cause. So there's a lot of good tools, there's fantastic data, we have reams of data, that will allow us to leverage what we know, Pareto what we know, and make sure we're going after what we need to, to solve the problem...um... read me the question again just to make sure I answered it

K: The question was: How does [Company Name] continually adopt new and improved ways to do work? And what are some of the new and improved ways...so what are some examples...you just gave some of ...I guess 8D and fishbone approach...could you think of any other examples?...I guess I know those are more methodologies, how about technology wise, whether it's a new knitting machine or...

A: Well, let's start within my group, my team has done a wonderful job of Pareto-ing our quality defects. Stop marks are by far our biggest quality defect, so my, my team has come up with a way of setting up a new selvage arrangement of using spandex and certain pattern on the end of each, on the left and right side of each roll, to reinforce the selvage, so that we won't have as many selvage related defects, which will cause a number of stops that we had been seeing. We have seen a step improvement in our number 1 quality defects, simply because of that...certainly due to a lot of the ingenuity of the team and using our data. Using our data to look at, ok what machines, what styles are we having the biggest problems on, what are the biggest problems, lets Pareto what those defects are and lets use that, that data and then the just the core working knowledge of some really really good textile professionals to figure out how to make it better

K: That's great. Next question is: how does feedback from customers lead to changes in this company?

A: I think certainly, it's its key. I mean there's a continual flow of data on a daily basis back from our customers about what we did wrong, not necessarily what we did right, but certainly a lot of what we did wrong and that just kind of human nature, um, so the quality defects they're seeing, the product coming to them that does not meet their requirements for how it should be packaged and rolled and things like that. We continually see and get feedback from our customers on where we're not doing what we said we would do and what they need us to do to allow them to be successful

K: Can you...are you able to give an example of a customer feedback that you've gotten and how this company has adapted to that or changed appropriately. I mean...

A: So for us, I'll use stop marks again, I'll go back to the biggest one. Late last year, leading into early this year, we were getting from Grupo, one of our biggest customers, feedback that we were still, they were seeing way too many stop mark defects, you know we had allowed to go through the factory. When we have ways to, we can't necessarily make the machine stop when something like that happens, because that's its designed to do. Or our folks are trained to make sure we stop it and correct the defect, cause a stop, a machine doesn't, the stop mark is not a defect, it's the result of a defect. So what we did in response to that is that we saw that the new ADX quality tool had a very hard time detecting stop marks. So we put a reinforced discipline in place for all of the associates in knitting to mark, with a sharpie, every stop mark, every time they happen, so by putting that mark there, we're giving the downstream folks that much more ability to capture and contain those before we have stop mark that's not marked escape to the field. Then we put audit programs in place to follow up on what they were doing, so a layered approach to making sure we're marking them or auditing what we mark and then the face and lamination inspection folks have that much more opportunity to catch something because we have identified it a defect so that we contain that before the customer saw it.

K: How is failure viewed at this company, is it viewed as a setback or an opportunity to learn and improve?

A: Both. They certainly at the end, are teaching opportunities...the teaching approach could be better...but to me that's kind of style dependent. Different leadership styles, different teaching styles, and I certainly have my own, my own preferences and opinions on the best way to get results. I think in the end, the results are achieved, but how well the associates and the other leaders here can be motivated to achieve those, leaves some room for improvement.

K: Do you have an example of a recent failure, and whether it was, lean more, that failure lean more toward a setback or opportunity or both I guess.

A: Not right off the top of my head

K: That's fine. My next question is: how are decisions made in this company? And would you say that, the decisions are made at the level where information is best available?

A: ...

K: So I guess we'll start with: how are decisions made in this company?

A: Decisions are made typically made based on data, I will definitely acknowledge that. There's not a lot of things that happen of any consequence without the data to back them up. Certainly, there's a lot of intuition that goes into that, cause we move at such a fast, fast pace. So, striking that balance between, do I have enough data to make a good decision, or do I have some data so I can make a fast decision. So theres always striking that balance too.

K: Would you say this is the level of where information is best available?

A: say that again?

K: Would you say that it's at a level where information is best available? So I guess the level of data, I guess the question is might be more geared towards, is it made at, looking at this company since I'm an intern here, is it made at the level of operators versus top management, I guess as well, if you look at it that way, when decisions are ultimately made.

A: We certainly rely on the operator's to give us the data, to make the best business decisions. Their role is to record data, we have systems in place to collect that data. So we use the data that they record to make decisions, but our decisions are only based on as good as the data is. So there's always room for operator error, but that's always getting down to Gage R&R how good is your measurement system, how good is your data, make sure we're making good decisions based upon them.

K: Describe the role of teams in this company. Is it, do they, I guess, think of it this way, are teams very valuable and very used in this company? And if not why?

A: ...let me clarify, so cross-departmental teams, not so much. Within a department, at least from what I've seen, there's a certain amount of cohesion and teamwork, but resources are stretched very thin

K: Does this company continually invest in the skills of its employees? Like providing training, conferences or I guess sending to conferences, or mentoring at no cost to any of you individually?

A: Probably...not...

K: What would drive you to say that that [Company Name] doesn't continuously invest in the skills of its employees.

A: Well when you say continuously invest you use outside resources as a way of showing that investment. I just haven't seen that much here in my time here. Certainly they invest a lot through on the job experience. So on the job experiences is you know is a great learning tool, I just haven't seen, well no, so let me take that back. So there are things that we're doing to develop our...yes ok so there are things being done to develop our leadership team. Again, it's still internal, so the things that HRs doing that Brad Bertholf is leading to kind of look we selected

to give them development opportunities, yes we are taking that upon ourselves. So we're doing a lot internally through either on the job training or internal ways of identifying some of our key associates to help them grow and become better future leaders. But I haven't seen much of anything in the way of outside resources invested.

K: Is that where you would like to see [Company Name] invest in its employee's skills more? Using more outside resources?

A: No, I'd like to see [Company Name] attract and retain more qualified problem-solving resources.

K: Okay, almost done here, do you believe the leaders and managers here follow the guidelines that they set for the rest of the company?

A: I believe to the very best of their ability...yes

K: Can you give an example of them following the guidelines, like give a guideline and how you've seen a leader or manager

A: I'll give you one maybe you wouldn't expect: I know we had a leader here who was not consistently demonstrating what I feel were the core values of, of what [Company Name] promotes as the way they will lead and respect employees, and he was removed from a very responsible position, and removed from the company because he was not displaying those core values that we expected, in the way of leading with integrity and respect

K: So it is held very high to lead by example

A: So that to me that was a good example of saying this will not be tolerated at whatever level you are

K: Okay that's great! How often does your team or department have trouble reaching agreement on key issues?

A: Not often. Everybody has the opportunity to speak up and then we need to make a decision and move on.

K: Okay. And if there are disagreements, how are disagreements resolved?

A: Through, um, uh....let's see...through healthy and lively conversation

K: Last question how do you coordinate, or second to last, how do you coordinate projects across the functional units and department in this company?

A: How do I what?

K: how do you coordinate projects across the functional units or departments in this company?

A: How do I do it? Or how does the company do it?

K: Um do you mind answering both? How do you do it and how does the company suggest to do it?

A: At least from my experience, AD HOC[impromptu], so most any work that's done across departments is AD HOC, but keep in mind I sit in leadership of one so I don't have responsibility to try and coordinate across departments. You know, project related activities, so I'm probably not the best to say here's how we do it. I just know when I see it, it feels very ad hoc

K: That's great. When you do see it, how long does it typically take for something to get done if you're trying to communicate across departments?

A: It varies, it really varies, its um...it depends on bandwidth and resource availability and whatever's hot in that department. But that's just kind of like life, we all have those things going on outside of work as well as here.

K: That's great.

K: That concludes the interview at 3:40

Interview Transcript

Chris Reneau, MBB, NAA CI Leader

K: This is interview 3 with Chris Reneau a Master Black Belt it is August 7th, 3:34. What is your name?

C: Chris Reneau

K: And what Six Sigma belt are you certified in or pursuing to be certified in?

C: I'm a certified Master Black Belt

K: How many Six Sigma projects have you participated in at [Company Name]?

C: Do you define participation as being involved in or led?

K: Both.

C: Can I give you an approximate number?

K: Yeah approximate is fine

C: 120

K: How many team members were on the last Six Sigma project you were involved with?

C: 6

K: What was your role on the last Six Sigma quality improvement project you participated in?

C: Team leader, facilitator

K: What were the approximate cost savings realized from that last Six Sigma project?

C: \$750,000

K: Now I will start the interview questions. My first question is: What is the mission of [Company Name]?

C: [LAUGHS] To be...the...Can I look it up?

K: It's fine since we're here

C: Ugh...let's see...[LAUGHS]...I apologize sir...to be the automotive textile leader in automotive textiles...

K: [LAUGHS] that's fine do you feel that this mission clear and gives meaning and direction to the work you do every day here?

C: No.

K: Why or why not?

C: it's ambiguous. Ambiguity is a big...it provides a...a mission statement provide, is supposed to provide a course and direction, and I feel like it's a vague inapplicable term

K: What are some of the goals set by the leaders of this company?

C: To improve safety, to improve quality, to improve earnings, and to improve on time delivery...and I feel really bad that I do not have that thing...keep asking

K: What do you think about these goals set by the leaders of this company?

C: I think they're aggressive and challenging

K: Could you expand upon that? ... sorry

C: No, don't apologize, you don't have to say sorry on the thing [LAUGHS]

K: I have a natural...thing to say sorry a lot

C: I know, you're a people pleaser

K: Yep.

C: Hold on a sec. okay, so your question was can I expand upon these goals?

K: Yes.

C: I believe it is in our best interest as far as like on time delivery and quality to achieve those levels based on our process capability it's very very challenging. Without significant capital investment in assets to include machines and people, it will be challenging.

K: Awesome. Does the vision of this company motivate and excite you to do your work? Why or why not?

C: No, because our mission statement is to be the world's leading technical textiles solutions provider. It a...we're going to improve the customer experience, act globally, lead commercial innovation and manufacturing excellence. Why it doesn't inspire me is because those are not behaviors I typically see from our senior leadership.

K: Okay that's great. How does this company continually adopt new and improved ways to do work?

C: Not very successfully. Textile industry from my experience in this site, does not adapt to change or innovation very frequently unless forced to.

K: Have you seen any examples of where [Company Name] has been forced to adapt new and improved ways?

C: Yeah, we've brought in new equipment that...traditionally would incorporate a...let's say a 1 year ramp up, and it's brought online within 1 – 2 months.

K: How often does feedback from customers lead to changes in this company? Can you give me any examples?

C: Well if we have a quality defect that's going to affect our end, the end user, such as Chrysler, Ford, BMW. It requires quick reaction, quick change, but the issue we have at [Company Name] is a that the issue will return because we don't a very good job in the control phase and locking down the changes that we've made, or understanding what cause those changes

K: How is failure handled at this company? Is it viewed as a setback or an opportunity to learn and improve.

C: It's a setback.

K: Can you give an example of a failure or setback?

C: Yeah all of our projects, all of our projects are typically behind, and it easily results in scolding and reprimand. And no root cause as to the reason for the delay, and a prime example is a our new Stentor Frame that we brought in that was originally designed to be the biggest and the fastest. We're currently not running at production level, and it's 9 months behind schedule...You'll have to elaborate on what a Stentor frame is because you know that.

K: How are decisions made in this company? Would you say it is at the level where information is best available or least available?

C: Least available.

K: Are they made in group decisions or

C: Independently

K: Describe the role of teams in this company.

C: I.

K/C: [LAUGHS]

C: Is that the best way I can put it? That's...that's the best way I can put it. You've seen the phrase, to copy the U.S. Army, "an army of 1." There's not a lot of team...team involvement...or opportunities for team involvement. You don't walk down the halls and see a lot of teams having meetings.

K: Okay. Does this company continually invest in the skills of its employees? Like providing training, conferences or mentoring at no cost to you individually?

C: Some individuals yes, other individuals no. collectively as an organization, no. Only those individuals that push continuing education.

K: Have you personally in any way, shape or form gained from this continuously investing, the company continuously investing in you with conferences, training and mentoring?

C: No.....I mean I did get the ability to go to a Lean training, the first one I've been to in the 2 years I've been here recently. I guess I should say I picked up a little bit of knowledge

K: Since you said collectively, no. Where would you like to see [Company Name] invest it's employee's skills more?

C: In any and all endeavors. I think our employees could use skilled development in everything from Lean to Six Sigma to standard work to even financial things. The financial in, the financial income, we're in a typically low economic area so anything we can do to enhance the lives or add value to the individual, I think [Company Name] has a lot of opportunity there.

K: Do you believe the leaders and managers follow the guidelines they set for the rest of the company?

C: Some do, some don't.

K: Can you give an example of the one's that do.

C: Arnold Lynch. He's our knitting manager, I think he generally cares and demonstrates passion, and leadership, and integrity. And I will not give an example of someone that doesn't [LAUGHS]

K: How about...since you can't give an example...

C: You understand why I can give an example...

K: Yeah but if not, what is a guideline that has not been followed by leaders and managers?

C: Integrity and respect for other individuals.

K: How often does your team or business unit have trouble reaching agreement on key issues?

C: Frequently. And the reason why is some see a solution as a band-aid and others would like a long-term solution

K: How are disagreements resolved?

C: Through arguments and sometimes the most influential person in the room will win the argument

K: How do you coordinate projects across functional units, departments in this company?

C: Discussions with functional business unit leaders or department managers

K: How long does it take, typically take, I guess a project to get started or initiated or to get going.

C: It can be anywhere from 1 – 3 months

K: And that concludes the interview. Thank you.

APPENDIX F: Email Requesting Employee Survey Participation

Subject: Summer Intern - Kevin Bui Thesis Research Survey

All,

My name is Kevin Bui and I am a summer intern here at [Company Name]. I am from the College of Textiles at NC State University. At NC State University, one of the things I am studying is the relationship between company culture and Six Sigma quality improvement initiatives. The management here at [Company Name] has given me permission to ask some employees about their views and experiences with the company culture and six sigma projects. I would greatly appreciate your help. If you are willing, I have a survey that I would like you to complete. It will take approximately 15 minutes. Just click on this link to begin: <https://www.surveymonkey.com/s/K9DSDXJ>. Please complete the survey by **July 20, 2012**.

Thank you,

Kevin Bui

Textile Extension for Economic Development, *Graduate Research Assistant*

Candidate for Masters of Science in Textiles

North Carolina State University

College of Textiles

Email: kdbui@ncsu.edu

Phone: [919-623-3856](tel:919-623-3856)

APPENDIX G: Email Requesting Interview Participation

Subject: Interview on Company Culture and Six Sigma Projects

Hi _____,

My name is Kevin Bui and I am a summer intern here at [Company Name]. I am from the College of Textiles at NC State University. At NC State University, one of the things I am studying is the relationship between company culture and Six Sigma quality improvement initiatives. The management here at [Company Name] has given me permission to ask some employees about their views and experiences with the company culture and six sigma projects. I would greatly appreciate your help. If you are willing, I would like to conduct an interview that will not be linked back to your identity. It will take approximately 30 minutes. Please contact me at kdbui@ncsu.edu and we can set up a time to meet.

Thank you.
Kevin Bui

APPENDIX H: Survey

Kevin Bui Thesis Research Survey

Consent Form

You are being asked to take part in a research study. Your participation in this study is voluntary. You have the right to be a part of this study, to choose not to participate or to stop participating at any time without penalty. The purpose of the proposed research is to examine the relationship between the culture of a company and the success of quality improvement projects within the textile industry. From this research done, there will be recommendations provided for companies wanting to invest in the culture of their company and increase the success of Six Sigma projects.

In order for this to be possible, we need your input and experience on basic company culture values within your company. When the research is complete, your company will be provided a final report to aid their company in furthering their efforts in the culture of the company if they wish to do so.

Your participation in this study is voluntary. You have the right to be a part of this study, to choose not to participate or to stop participating at any time. The information you provide in this survey will be kept confidential. Data will be stored securely on a password protected server accessible only by the principal investigator, Kevin Bui, and his thesis advisor, Dr. Lori Rothenberg. Though you will be asked to provide your position on a company project, when the research is complete, this information will be deleted and replaced with a code number that does not identify you or the project team. Project positions are for investigator identification only and will not be identified in the published research. There is no monetary compensation awarded for participation in this study. You will be asked to discuss your workplace and work environment. If you are completing this survey at work and are concerned about anonymity of your responses, please be sure to close your browser after your survey is complete or if you leave your computer prior to finishing.

Participation in this study is not a requirement of your employment at Guilford Performance Textiles, and your participation or lack thereof, will not affect your job.

Your cooperation is greatly appreciated. If you have any questions concerning this study, please contact me, Kevin Bui, at kdbui@ncsu.edu or my thesis advisor, Dr. Lori Rothenberg, at Lori_Rothenberg@ncsu.edu.

If you feel you have not been treated as described here, or your rights as a participant in research have been violated during the course of this project, you may contact Deb Paxton, Regulatory Compliance Administrator, Box 7514, NCSU Campus(919.515.4514).

1. Have you read the full informed consent statement and agree to participate in this research?

- Yes, I give my consent.
- No, I do not give my consent.

Kevin Bui Thesis Research Survey

Basic Information

2. What is your gender?

- Male
- Female
- Prefer not to answer

***3. Have you participated in a Six Sigma quality improvement project with Guilford Performance Textiles?**

- Yes
- No

Kevin Bui Thesis Research Survey

Six Sigma Information

4. Are you Six Sigma Certified?

If "Yes", please indicate which certification(s) you have received.

If you are currently working on receiving a certification, please indicate which certification is being strived for.

	Green Belt	Black Belt	Master Black Belt	Not Certified
Yes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Certification In-Progress	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. How many Six Sigma projects have you participated in at Guilford Performance Textiles?

- 0
- 1
- 2
- 3
- 4
- 5 or more

6. How many team members were on the last Six Sigma project you were involved with?

7. What was your role on the last Six Sigma quality improvement project you participated in with Guilford Performance Textiles?

8. What were approximate cost savings realized from the last Six Sigma project?

- \$15,000 or less
- \$15,001 - \$45,000
- \$45,001 - \$75,000
- \$75,001 - \$105,000
- \$105,001 - \$135,000
- \$135,001 or more

Other (please specify)

Kevin Bui Thesis Research Survey

Involvement

9. Empowerment and Involvement

	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
Decisions are usually made at the level where the best information is available.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information is widely shared so that everyone can get the information he or she needs when it's needed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Everyone believes that he or she can have a positive impact.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. Team Orientation

	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
Working in this company is like being part of a team.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This company relies on horizontal control and coordination to get work done, rather than hierarchy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Teams are the primary building blocks of this company.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

11. Capability Development

	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
This company is constantly improving compared with its competitors in many dimensions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This company continuously invests in the skills of employees.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The capability of people in this company is viewed as an important source of competitive advantage.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kevin Bui Thesis Research Survey

Consistency

12. Core Values

	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
The leaders and managers follow the guidelines that they set for the rest of the company.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is a clear and consistent set of values in this company that governs the way we do business.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This company has an ethical code that guides our behavior and tells us right from wrong.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. Agreement

	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
When disagreements occur, we work hard to achieve solutions that benefit both parties in the disagreement.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is easy to reach consensus, even on difficult issues.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We often have trouble reaching agreement on key issues.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

14. Coordination & Integration

	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
People from different business units still share a common perspective.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is easy to coordinate projects across functional units in this company.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is good alignment of goals across levels of this company.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kevin Bui Thesis Research Survey

Adaptability

15. Creating Change

	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
This company is very responsive and changes easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This company responds well to competitors and other changes in the business environment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This company continually adopts new and improved ways to do work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. Customer Focus

	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
Customer comments and recommendations often lead to changes in this company.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Customer input directly influences our decisions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The interests of the final customer often get ignored in our decisions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17. Organizational Learning

	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
We view failure as an opportunity for learning and improvement.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This company encourages and rewards those who take risk.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We make certain that we coordinate our actions and efforts between different units in this company.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kevin Bui Thesis Research Survey

Mission

18. Strategic Direction & Intent

	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
This company has long-term purpose and direction.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This company has a clear mission that gives meaning and direction to our work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This company has a clear strategy for the future.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

19. Goals & Objectives

	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
There is widespread agreement about goals of this company.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leaders of this company set goals that are ambitious, but realistic.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The leadership has clearly stated the objectives we are trying to meet.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

20. Vision

	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
We have a shared vision of what this organization will be like in the future.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leaders of this organization have a long-term orientation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our vision creates excitement and motivation for our employees.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Kevin Bui Thesis Research Survey

If you would be willing to discuss company culture and Six Sigma further in the format of a 30 minute interview, please contact Kevin Bui at kdbui@ncsu.edu.