HOW TO OBTAIN LEADERSHIP SUPPORT FOR SIX SIGMA IMPLEMENTATION PROJECTS

by

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Abstract

Project managers face numerous challenges when implementing projects in an organization. Barriers project managers can face include employees' resistance to change, failed sustainment of solutions, and inadequate time and resources available for their project work. Each of these conundrums can be eased when leaders of the organization support the project managers in their efforts. A system focused on reducing problems and errors is Six Sigma. Six Sigma has been touted as one of the most impactful problem-solving systems deployed. This system uses statistical analysis and a project approach to problem solving. Through the elimination of waste, Six Sigma practitioners find success in improving quality, productivity, customer satisfaction, and employee engagement. Though the system has a proven track record of delivering outstanding results for well-known companies, some organizations struggle to sustain the system. One of the critical success factors to the success of implementing and sustaining Six Sigma is leadership commitment. When leaders champion the implementation effort, the project to introduce and incorporate a Six Sigma program is much more likely to be completed successfully. This study is designed to examine how project managers can garner leadership support while executing a project to implement Six Sigma. Six Sigma practitioners need leaders to engage in the effort and support implementation efforts to ensure their projects are successful.

Keywords: Project management, Six Sigma, leadership support, sponsorship

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Section 1: Foundation of the Study

In the current business environment, leaders of corporations are faced with ever-changing consumer demand, increased competition, and varied employee expectations (Leybourne, Warburton, & Kanabar, 2014). Business leaders seek avenues to enhance competitiveness and ensure longevity. One method of enhancing performance in this complex atmosphere is managing with a project focus (Chen, 1997). Projects that are well planned and successfully executed can provide a structure and forum for delivering corporate strategic objectives and improving effectiveness (Ranf, 2011). Leading with a project management approach affords leaders an opportunity to capitalize on well-structured methods of understanding and delivering customer requirements (Spalek, 2014). This method of managing and organization provides long-term benefits.

Employee skills and engagement are enhanced through a project management approach to running a business, which enhances long-term organizational performance. Through leading projects, employees have an opportunity to develop leadership skills and demonstrate capabilities to spearhead important endeavors (Spalek, 2014). Well-executed projects provide impactful gains such as enhanced information systems, improved business processes, and greater ability to deliver to customer expectations. Achieving significant accomplishments such as these provides employees a sense of purpose and value. As employees grow in ability to deliver successful projects and further engage in the business, consumer satisfaction and organizational competitiveness are increasingly improved.

Project managers are called upon to lead increasingly complex and significant initiatives. The project managers need a supportive network to ensure substantial projects are selected for pursuit. Strategically impactful projects should be staggered methodically in order to build upon project deliverables progressively and advance the organization toward critical objectives

(Spalek, 2014). Strategically timed projects allow business leaders a structure to guide with a project management approach (Spalek, 2014; Leybourne et al., 2014). The effective delivery of properly coordinated projects is often positively correlated to the success of a company, so business leaders must increase organizational knowledge of project management to ensure sustained viability through well-timed innovation and improvement efforts (Leybourne et al., 2014). As the understanding of project management is increased, the members of a corporation are better equipped to understand where project efforts can improve business performance.

Business leaders seek to understand gaps in organizational performance that increase risks to viability in the market place. These leaders understand that excessive lead times and inefficient processes are detrimental to achieving customer anticipations. Many organizational leaders have attempted to launch quality programs to address these types of inadequacies within their companies (Albliwi, Antony, Lim, & Van der Wiele, 2014). Project managers profit from having established methods to follow when leading improvement projects.

Project managers can seek solutions to problems within business procedures that result in poor quality or product design by using data acquired and compiled with quality management system tools, but a more fluid and structured approach for solving challenges can be found in Six Sigma. Six Sigma has been determined to be an effective method for reducing costly wastes and increasing customer satisfaction (Thomas, Ringwald, Parfitt, Davies, & John, 2014). Six Sigma is a well-proven problem-solving method imbedded in the project management field. The system provides a phased approach to defining and addressing problems causing customer satisfaction failures. Each phase has a set of tools available to the project manager to lead a team through project delivery and sustainment of solutions. Projects are chosen based on business priorities, and a pipeline of projects is generally defined to help business leaders understand when efforts will be launched to address known problems.

A well-defined project portfolio helps project managers trained in Six Sigma manage their time and project obligations. The projects are pursued methodically, based on business and customer needs. As projects are closed and project managers are made available, projects in the pipeline are selected based on strategic importance. The Six Sigma program, which consists of an ongoing cycle of project selection and completion, aids in enhancing business performance. Project managers need leadership engagement in the project selection stages.

Project managers who are accountable for spearheading the implementation of programs such as Six Sigma are often expected to introduce the program, organize the training, and manage project portfolios. Project managers need business leaders to champion each of these tasks. Positive leadership behavior allows a Six Sigma program to be successfully effected and provides an opportunity for the system to deliver improved business performance.

Although Six Sigma has been found to be beneficial in improving profitability of organizations, there are challenges with implementing successful and sustainable programs. While many organizations have demonstrated remarkable improvements using the techniques and tactics of the Six Sigma system, approximately 70% of the companies that have sought to implement the system have failed (Albliwi et al., 2014). The failures could be caused by inadequate leadership support (Sharma & Sharma, 2014). Leadership commitment is imperative to the success of the full system, and is needed throughout the implementation process and for on-going sustainment (Sharma & Sharma, 2014; Jobin, 2015). Without adequate backing, the system implementation will fail.

For businesses to realize the value provided by the system, project managers working to implement Six Sigma in organizations must be provided an environment conducive to successfully completing their implementation projects. Project managers must have the support of leaders, and there must be on-going support for the projects pursued within the system to

ensure program sustainment. Leadership support is imperative for the implementation since employees will feel the effects of the change. Change can create turmoil for employees, and project managers need support managing the transformation of business practices as Six Sigma is introduced.

Project managers held accountable for system implementations do not currently have a framework for obtaining leadership commitment. This study explored how Six Sigma project managers can influence leaders and gain adequate commitment levels that are favorable for a successful program. The methods that are determined effective for garnering support from leaders will be applicable to project managers who lead implementation initiatives.

To provide a foundation for this study, the first section includes the background of the problem, problem statement, purpose of the study, and conceptual framework. The key terms used in the paper are defined in this section, assumptions are explained, and the significance of the study is expressed. A thorough review of literature is presented to compare and contrast various researchers' findings and the relationship of their work to this study.

Background of the Problem

Increased globalization, competition, and market complexity have presented challenges for business leaders seeking to remain viable competitors in their industries. They are realizing the previous methods of cost reductions, which included layoffs, early retirement packages, and reduction in force through attrition, have left them with a smaller work force to accomplish the same amount of work (Kezner, 2009). Project management methods have provided proven tactics for achieving organizational objectives and realizing efficiency improvements in this complex business environment (Zagorsek, Hlavova, & Bolek, 2017). The methods introduced in the project management structure allow business leaders a forum for reducing wastes in business

processes and better delivering on customer expectations at the right price with acceptable quality, allowing for enhanced competiveness.

Project managers understand organizational performance, resource allocation, and talent development are critical for a thriving business. In the standard practice of project management, frequent monitoring of customer satisfaction and expectations is a method utilized to track how current consumer requirements are being met and what changes are required to maintain or build market share. When organizational performance falls short in achieving customer needs, well-scoped projects can be a catalyst to deliver innovation and cost efficiencies consumers demand. Overall company performance can be strongly impacted by how well an organization delivers projects (Spalek, 2014). For business permanency, organizations must be prepared to deliver projects successfully.

Project Management as a Business Strategy

Project management provides a philosophy for managing an organization and is seen as a business process rather than a method for conducting projects (Kerzner, 2009). Kerzner (2009) explained project managers must successfully garner leadership commitment and project management methods should be adopted and followed consistently. When assuming this approach to management, business leaders choose to work toward a business strategy and corporate vision one initiative at a time.

To ensure success in enhancing business performance with a project management structure, project managers must understand that leaders play a critical role in navigating business strategy through project management. The leaders are responsible for communicating the project management methods to the employees and insisting that the techniques are used (Kerzner, 2009). They must ensure that effective project plans are established at the beginning of each project, projects are resourced through trained project professionals who can competently

manage the scope and cost of the project, and executives are well-prepared and committed to serve as project sponsors (Kerzner, 2009). Leaders must guarantee that progress is measured and communicated at a set cadence so that all stakeholders understand the value provided by the projects and recognize those responsible for executing projects (Kerzner, 2009). This framework must be followed to motivate employees to improve the business through executing impactful projects. Project managers who notice a gap in leadership support must discover ways to enlist adequate backing and sponsorship for the program.

Projects Focused on Quality Improvement

As Kerzner (2009) provided, a well-structured project management system can provide constructs effective for managing an organization. Six Sigma can serve this purpose and is a method designed to drive improvements through a statistical approach to project management and continuous improvement techniques (Albliwi et al., 2014; AlSagheer & Hamdan, 2011). Through the methodical techniques provided by Six Sigma, problem solvers can uncover the root causes to costly wastes and develop solutions to mitigate or eliminate them. These procedures help improve business processes and quality, which reduces operational costs and improves customer satisfaction.

Six Sigma is a means to improving multiple facets of business operations. Oke (2007) explained that successful Six Sigma programs increase timely project completion, leading to improved time to market, streamlined operations, customer retention, competitiveness, quality, productivity, and employee engagement. Mader (2007) explained that for a company to realize Six Sigma success, sound project management practices and a strategic cadence of project selection must be in place. Strong project management skills are imperative to a successful Six Sigma program, as problems are solved through projects (Moosa & Sajid, 2010; Brun, 2011).

The guidance Kerzner (2009) provided for effective management through the employment of project management concepts is directly applicable to finding success while using Six Sigma as a business management tactic. Currently, project managers charged with implementing Six Sigma are not instructed on effective methods for informing business leaders of the value these methods have for enhancing business performance. Project managers need guidance on how to persuade leaders of the effectiveness of this approach to achieve adequate backing for successful implementations.

Project Managers' Quest for Leadership Support

Project managers face challenges with implementing successful and sustainable systems. One of the critical success factors for viable systems that project managers must work toward achieving is leadership support for projects (Kirchner et al., 2012; Choi, Kim, Leem, Lee, & Hong, 2012). There is no existing model for project managers to follow when working to gain leadership support. Project managers know leaders need to understand the value of projects in order to provide the leadership necessary for successful and sustainable results (Oke, 2007; Moosa & Sajid, 2010). A struggle that project managers face is determining the most appropriate methods to communicate so leaders will connect with the message and be motivated to champion projects.

Project managers assigned to implementations. The typical placement of a Six Sigma program within an organization may present challenges to project managers seeking to implement a sustained system and achieve adequate leadership backing for the effort. When organizations have a well-established project management structure for endeavors such as computer system integrations and resources trained as experts to lead projects, leaders tend to understand that project managers within the organization are capable of implementing programs, putting information systems in place, driving construction efforts, and coordinating large-scale

events. Project managers seem to be provided the resources needed to see their efforts through, including support from leaders. Six Sigma systems are not typically part of this type of project management organization structure and the value of Six Sigma is not as well understood as is the worth of large-scale initiatives conducted to meet a specific need. This structural design could present complexity for project managers seeking to gain leadership support. Project managers leading a system implementation effort may need to consider how the structure of the organization can impact the outcome of the system introduction and deployment. Perhaps the drive to implement the system should be owned by the project management organization, so that leaders will associate the effort with other types of system introductions.

Six Sigma systems are generally deployed and overseen separately by Master Black Belts who coordinate training, project selection, and project manager assignments. Master Black Belts are not generally project managers called upon to deliver large-scale initiatives, such as introducing a new computer system or leading construction projects. Their expertise is typically called upon to uncover problems or negative trends through the use of advanced statistical tools. The specialized skills possessed by Master Black Belts may create confusion about the purpose of the effort to implement a Six Sigma system. The decision to employ Master Black Belts to roll out a system may need to be revisited. Perhaps project managers within the project management organization would be better backed in an implementation effort.

Messaging. Project managers striving to implement a new system understand that the value the structure or method provides should be communicated to leaders. The manner in which the message is delivered could be impactful to achieving necessary levels of support. Project managers should explain to leaders that when the system is followed by employees, productivity, profitability, quality, and employee engagement are enhanced (Enoch, 2013; Oke, 2007). When considering that leaders choose systems such as Six Sigma to accomplish these

goals, the message seems to be aligned with what the leaders value. Project managers would benefit from a framework that would guide them in how to communicate the positive impact of the system in a way it will help generate and sustain enthusiasm and support for the system.

Project managers' success explaining the value of the implementation is important, because they need leaders to provide comparable information to employees. Project managers need to be able to trust that leaders will champion communication efforts to ensure employees and stakeholders understand the value of the system (Kezner, 2009). When project managers discover communications are not being provided as needed, they need to address that gap. Leaders may respond well to being asked to communicate specific items to a defined audience. Project managers would be aided by ideas for prompting leaders to communicate to employees.

Communicating system value. Project managers strive to educate leaders about the worth of driving wastes out of business processes through a project management approach because practitioners understand the support from leaders is imperative to project success. Leaders have the appropriate leverage to determine what methods employees will follow when solving problems, and they have the authority to ensure employees apply Six Sigma tools and techniques in their daily work to improve profitability and quality (Choi et al., 2012). Project managers depend on the participation of employees and business leaders.

Practitioners know that leaders who demonstrate their commitment to Six Sigma and communicate appropriately will have employees who understand the value of the system and follow the processes provided by Six Sigma (Choi et al., 2012). Leaders are not always receptive to the practitioners' message regarding the value of the system and they often fail to demonstrate the leadership the practitioners hope they will. Insufficient support from midlevel and executive leaders causes barriers for project managers attempting to rally enthusiasm toward

using a methodical approach to solve problems and improve business performance. Practitioners need a proven method for garnering support from leaders.

Risks to implementation. If a project manager attempting to implement a system cannot achieve the buy in and support of the leaders in the organization, the implementation will fail. If project managers cannot obtain leadership support for individual projects, a program like Six Sigma is at risk of failing to provide savings and quality advantages to the company, which would hinder the likelihood of system sustainment. Suresh, Antony, Kumar, and Douglas (2012) explained leaders of businesses seeking to implement a quality system must demonstrate their commitment through relentless communication and program reinforcement or the system may fail. Failed implementations have been blamed on a lack of leadership (Kwak & Anbari, 2006; Moosa & Sajid, 2010; Brun, 2011). Unfortunately, leadership can wane since implementation and change management initiatives demand high levels of involvement and time (McLean & Antony, 2014). Priorities shift over time, and leaders can lose focus. How project managers can influence this situation is undefined.

In the best case scenario, leaders at all levels would express their commitment to the program through encouraging employees as they learn the methods used in Six Sigma and requiring employees to apply the system as they strive to fix problems (McLean & Antony, 2014; Choi et al., 2012). Six Sigma practitioners are not typically part of the upward reporting structure for the people in leadership positions, and cannot oblige leaders to demand employee participation (Hilton & Sohal, 2012). They must influence without authority, persuading leaders to back the system without ceasing. When leaders fail to provide commitment to the system, practitioners face the challenge of finding ways to obtain their support.

Support linked to success. Despite the struggle project managers have in convincing leaders to demonstrate commitment for the system, the quest is worthwhile. The literature on

Six Sigma implementation lists leadership commitment as a critical success factor for system deployments and sustainment (Knapp, 2015; Brun, 2011; Moosa & Sajid, 2010; Kirchner et al., 2012; Choi et al., 2012; Laureani & Antony, 2012). Information is available for what type of involvement leaders should have and what skillsets would enable them to deploy and sustain the system (Suresh et al., 2012; Moosa & Sajid, 2010; Kirchner et al., 2012). Senior-level leaders must be committed to the program and provide resources for the implementation, training, and deployment of the system (Kwak & Anbari, 2006; Brun, 2011). Often, senior-level leaders who might deploy a Six Sigma system do not reside at the manufacturing facilities, and the mid-level leaders at the plants do not maintain commitment for the system (McLean & Antony, 2014). Practitioners must determine how to garner commitment from leadership at the manufacturing locations.

Knapp (2015) and Antony (2013) found that backing for leaders is critically important to implementing a successful Six Sigma program and Kumar, Antony, Madu, Montgomery, and Park (2008) explained that successful sustainment of the system is dependent on the support of leaders and proper execution of the implementation. However, methods for obtaining the leadership support have not been identified in prior research.

A gap in defining how to obtain leadership support remains for practitioners seeking to deploy a successful system. Practitioners are not provided a framework for effectively influencing leaders to make a commitment, engage at appropriate levels, and demonstrate the behaviors necessary for a successful system deployment. An understanding of what leadership attributes are present in successful implementations and why some leaders fail to provide adequate levels of support to those striving to implement a project-based problem solving system should give insight into what should be included in a framework to gain support from leaders for system implementations.

Additional critical success factors. Leadership support is not the only contributing factor to a successful system deployment. Project managers may be able to create and execute thoughtful strategies to meet the leaders where they are in understanding and show the value of the system. Proving value might be accomplished through demonstrating the effectiveness of project execution at driving corporate strategic objectives. Should project managers be able to deliver quick wins on initiatives important to leaders, the overall leadership support of a Six Sigma system could be increased. However, risk remains if practitioners cannot quickly convince leaders to provide resources for projects and buy into recommendations for solutions. Leadership support for project execution within Six Sigma is imperative for system sustainment.

Implementing Six Sigma requires focus and discipline (Moosa & Sajid, 2010). Suresh et al. (2012) explained Six Sigma requires a devoted commitment and unprecedented level of support from leaders to be successful. For those in organizations who are working to implement Six Sigma systems and are experiencing fading levels of leadership, methods to strengthen other critical success factors of system implementations may be beneficial to help leaders see value in Six Sigma deliverables. To aid Six Sigma practitioners with this, the critical success factors must be defined.

Successful Projects for Leader Support

When well-timed Six Sigma projects are successful in achieving corporate strategies, the likelihood of system sustainment is enhanced. Successfully delivering strategic objectives can enhance business leaders' perception of the value of the system. The challenge with being able to use successful projects to convince leaders the system is valuable is that leadership support is necessary for projects to be executed successfully.

Problem Statement

The general problem to be addressed is that Six Sigma implementation efforts often fail. Albliwi et al. (2014) found that 70% of the companies that have sought to implement the system have failed and Sharma and Sharma (2014) suggested the failures are often related to inadequate leadership support. System implementations are costly to organizations, so a 70% failure rate is unacceptable. Six Sigma implementations are complex and are at a heightened risk of failure if project managers striving to implement the program are unable to obtain consistent leadership support. Successful sustainment of the system is dependent on the support of leaders and proper execution of the implementation (Kumar et al., 2008; Knapp, 2015; Antony, 2013; Jones, Parast, & Adams, 2010). The specific problem addressed by this study was that project managers who lead Six Sigma implementation initiatives do not always have reliable leadership support for implementation efforts. The focus of this study was to explore how project managers employed at a global corporation and serving nine manufacturing facilities in the United States and four manufacturing facilities in the United Kingdom can find success in garnering leadership support to heighten the likelihood of successful system implementations.

Purpose Statement

The purpose of this qualitative case study was to understand how project managers that implement Six Sigma systems can achieve the needed support from leaders in manufacturing organizations at the production facility level. At this stage in the research, the support project managers need to garner from leaders will generally be defined as participation within the project management system as project sponsors and champions and insisting that Six Sigma project management methods and statistical tools be used to reduce errors and inefficiencies. This study was designed to provide guidance for practitioners to follow to obtain leadership support for implementing and sustaining Six Sigma programs. The important elements for obtaining

leadership support will be described. The case study will provide information on the suggested tactics for successfully attaining necessary levels of leadership support, according to Six Sigma practitioners, mid-level managers, and employees in a manufacturing environment.

Nature of the Study

In this qualitative case study, data were gathered from Six Sigma practitioners and employees through direct observations and interviews. The Six Sigma practitioners included in the study were currently employed with a large, global manufacturing company and were interviewed about the challenges they faced with deploying the Six Sigma system and elements of success they found in enlisting support from leaders based in manufacturing facilities. Employees of the same organization were observed to uncover how likely they were to use Six Sigma tools and methods when charged with fixing a problem. The observations informed the study of how the responses leaders gave to questions related to the levels of support they provided for the system were linked to employee engagement in the system. These interviews and observations were designed to provide information on how project managers can garner support from leaders for Six Sigma implementations. The study should assist project managers with understanding if the elements of leadership support suspected to provide elevated employee engagement in the system prove effective. Through this study, a framework for enlisting leadership support should begin to take shape.

Methods

Three types of research methods are available to guide research studies. The first method, the quantitative method, provides a structure for examining the relationships among variables (Creswell & Poth, 2017). Statistical procedures can be used to analyze the impact of these variables on a studied output (Creswell & Poth, 2017). The second method, the qualitative method, provides a framework for understanding the perception of individuals or groups of a

particular social or human problem (Creswell & Poth, 2017). This approach involves a review of procedures and data, allowing the researcher to interpret the meaning of the data (Creswell & Poth, 2017). Observations and evaluation of documents inform the researcher's findings (Creswell & Poth, 2017). And the third method is the mixed methods approach in which the qualitative and quantitative forms are combined to aid the researcher in understanding a phenomenon, circumstance, or event (Creswell & Poth, 2017).

Method Chosen

Since this study was focused on a question that explains how something occurs, a qualitative model is most appropriate and will guide this study (Stake, 2010). Stake (2010) guided researchers who wanted to discover meanings and study real-world settings in a natural environment to use the frameworks provided by a qualitative study. Statistical measures and analysis, which are included in quantitative studies (Creswell & Poth, 2017), are not included in this study plan, because observations, interviews, and surveys will provide the information needed to understand how to gain adequate levels of leadership support for a system implementation. These are tools used in qualitative studies (Stake, 2010). Because statistical tools are not necessary to the structure of this study on how leadership commitment can be attained for Six Sigma deployment, a mixed method would not be practical for this study, as a mixed method includes quantitative evaluations.

Qualitative Study Plans

To understand the perception of individuals who have been working in a company where a Six Sigma program is being introduced, a qualitative study has been chosen. An interview process has been selected for understanding the perception of the Six Sigma project managers because interviewees may provide feedback in a way responses can be understood more completely than through a typical survey. The questions are drafted in a way the interviewer

may be able to gain insight into implementations that went well and what elements should be considered as a standard for successful implementations. Also, the project managers have an opportunity to share what they perceive to be strengths of the training, certification process, and support structure within the system.

Research Question

The intent of the study was to understand how project managers can obtain the support of business leaders when striving to implement a Six Sigma system. The researcher interviewed project managers charged with implementing and sustaining Six Sigma and business leaders involved with the implementation. The interviews provided insight into the perceptions and experiences of these individuals as they have progressed through the implementation. The following question guided this study: How can project managers successfully obtain leadership support for Six Sigma implementations? The following sub questions also guided the research study:

How can project managers convey to leaders the importance of leadership support on successful completion of implementation projects?

How can leadership commitment be developed and sustained for the duration of the implementation effort?

What motivates leaders to champion initiatives?

Conceptual Framework

The following four concepts served as foundations for this study: the theory of change management; even without positional authority, project managers own project success; project success is dependent on leadership support; and the theory of constraints. The amalgamation of these theories provides a central concept that leaders must support projects and large-scale change initiatives for project managers to achieve successful outcomes, but are challenged by

competing priorities as they strive to work on the most important matters related to corporate success. This theme explains the complexities project managers face when striving to understand how to garner leadership support for system implementations.

One of the four concepts that guided this study was that leaders must manage change. Kotter's (2017) theory of change management helps explain the need project managers have for obtaining leadership support during large change initiatives, such as system implementations. Kotter (2017) charged leaders with the responsibility of creating an environment conducive for change, engaging employees, empowering members of the organization, implementing the new program or initiative, and sustaining the change. If leaders would champion change efforts in this manner, project managers striving to implement systems would have the foundation necessary for introducing the technical aspects of the change and would be relieved of the burden of managing the culture and the change itself. With this type of support, project managers would have a higher likelihood of a successful system implementation.

The purpose of this study involves exploring methods a project manager may employ to garner leadership support for a system implementation. Project managers cannot successfully drive a large change without the support of business leaders (Kotter, 2017). Currently, project managers do not have a structure to follow that would guide them in avenues to acquire leadership backing for a change initiative when leaders fail to champion the effort. This gap is a peril due to the powerful and critical role leaders have in guiding an organization through change (Kotter, 2017).

Another concept important to this study was that project managers own project success, but do not have positional authority over leaders that would afford them an opportunity to demand sponsorship (Bowenkamp & Kleiner, 1987). Project managers of system implementations must ensure leaders champion their efforts through paving the way for change

and holding employees accountable to requirements of the system for the effort to be successful. Gattiker, Carter, Xiaown, and Tate (2014) found that project success is dependent on leadership support, which served as the third concept that was foundational to this study, but project managers cannot insist that leaders support an initiative with direct authority. They must find ways to garner leadership when leadership commitment is lacking. The success of a system introduction is directly correlated to the commitment of leaders to guide the change effort.

Leading Change. Kotter's (2017) theory of change management provides a foundation for this study. It emphasizes the need that project managers have for gaining support from leaders during large change. Kotter (2017) explained that business leaders support change by establishing vision and guiding employees through change, which paves the way for a project manager to lead the charge. If leaders fail to create and communicate a vision, project managers are left with the challenge of creating a value statement to connect employees to the effort. This is a difficult position for project managers since they do not have direct authority over members of the organization and cannot impose requirements on employees. Project managers need methods for successfully garnering the support of leaders as they introduce a system so that the change can be navigated successfully and employees can understand the effort is important to the business leaders.

Business leaders who have chosen to implement a Six Sigma system do so because they plan to change the ways employees conduct business, seeking increased efficiencies and enhanced performance (Albliwi et al., 2014; AlSagheer & Hamdan, 2011). Determining what must be done to manage a challenging market and establishing a vision is the first step for leaders (Kotter, 2017). A challenge for project managers is that leaders may not support implementations beyond this step. Without ongoing sponsorship, project managers face the daunting challenge of communicating the value of the system and how incorporating Six Sigma

will help improve business performance and viability. They must also manage the impacts change can have on employees without the backing from leaders.

For an implementation to be successful, the leadership group should systematically plan for and create short-term wins to motivate employees to rally behind the effort (Kotter, 2017). Once the change has been proven as a success, the leadership team owns anchoring the changes into the culture of the company (Kotter, 2017). These steps are directly applicable to what project managers need from leaders during a system implementation. Project managers need established procedures for ensuring leaders champion efforts beyond the system selection and vision creation.

Sponsorship. Projects require sponsorship. The sponsors of projects are responsible for assisting the project manager with managing barriers and risks to the project, communicating the value of the work, and generating enthusiasm for the effort (Sunder, 2016). The sponsors of projects should be members of the senior or executive leadership team (Sunder, 2016). Project managers need sponsors to back project efforts consistently and throughout the initiative. When sponsors fail to support efforts adequately, project managers are faced with the challenge of effectively revitalizing the commitment.

Theory of Constraints. Goldratt and Cox (2004) introduced the theory of constraints, which is the idea of managing the production system as a series of independent processes and focusing on improving the system by honing in on the most important issues. The theory of constraints is defined as a management paradigm that considers any system as being limited in accomplishing additional goals by at least one constraint (Goldratt & Cox, 2004). A challenge that project managers seeking to implement Six Sigma face is that production managers are focused on resolving issues that present immediate barriers to achieving planned production volumes for the current shift, while the Six Sigma program is intended to rectify chronic issues

that hinder efficiency and quality over the long term. Goldratt and Cox (2004) suggested the focus of improvements should be guided by the strategic initiatives of the organization, and the most important focus is typically profitability. Leaders and project managers may be at odds when determining which areas of focus and actions drive profitability. Leaders may believe that meeting daily production volume targets will ensure profitability, while Six Sigma project managers are guided by Six Sigma principles that suggest chronic losses devastate profit margins over time. The misalignment of priorities may present barriers for project managers seeking leader support of a Six Sigma system implementation, particularly if leaders do not see value in a Six Sigma system due to the long-term focus.

The theory of constraints suggests that leaders and project managers will need to align on the constraint or constraints that must be corrected to rectify issues hindering the organization from achieving strategic objectives. Since resources are limited, this alignment is necessary so that assets can be devoted to the specific effort or efforts necessary to correct the constraints. Project managers would benefit from understanding the pressure leaders experience when attempting to achieve the goals set before them and naming the priorities that must be achieved to accomplish those objectives. Determining how project managers can be successful gaining leadership support may be connected to the challenge leaders face of devoting resources only to the highest priorities.

Concept Map. The concept of how leadership commitment impacts system adoption or change explains why project managers must have support from leaders. A project manager instituting a new system within an organization needs leaders to serve within the system, communicate about the system, ensure adequate training, and acquire and develop necessary talent. How project managers can persuade leaders to engage in these ways is not defined.

Figure 1. Conceptual Map for Project Managers' Dependence on Leadership Support

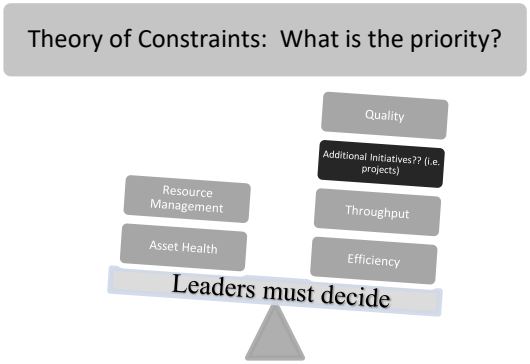

Figure 2. Theory of Constraints.

Definition of Terms

Black Belt: Full-time practitioner trained on advanced levels of applied statistics who leads projects, mentors project managers, and trains Six Sigma (Moosa & Sajid, 2010).

Champions: Heads of business divisions or process owners who support specific initiatives (Moosa & Sajid, 2010).

DMAIC: Six Sigma method of solving problems through a phased approach which includes defining the problem, measuring data, analyzing data, improving the situation, and implanting controls to sustain the improvement (Moosa & Sajid, 2010).

Emotional Intelligence: Aptitude of individuals to identify their own, and other people's emotions, to understand feelings, and to guide thinking and behavior with how others will respond, considering this information (Antonakis, Ashkanasy, & Dasborough, 2009).

Green Belts: Individuals trained to a basic level of techniques, typically devoted part-time to Six Sigma, and are expected to execute and mentor projects (Moosa & Sajid, 2010).

Leadership: A process whereby an individual influences others to achieve a common goal (Northouse, 2010, p. 3). For the purposes of this paper, leaders and leadership refers to persons in organizational roles in which they are expected to demonstrate leadership as a requirement of the job.

Leadership support: In the context of Six Sigma deployment, providing the tools and resources necessary to train employees and conduct projects to fix problems, requiring the use of the tools and techniques within the system, and allowing time for projects to be conducted correctly (Suresh et al., 2012).

Methodology: A sequence of steps is used to handle a situation, such as in the DMAIC process for Six Sigma (Moosa & Sajid, 2010).

Six Sigma Metric: The use of defect per million opportunities and rolled throughput yield instead of the commonly used defects per unit measures (Moosa & Sajid, 2010).

Six Sigma Program: A system that uses a statistical and project approach to problem solving (Hilton & Sohal, 2012) in which a group of projects geared toward business improvements that are managed in a coordinated manner to achieve strategic benefits (Marzagão & Carvalho, 2016).

Successful program: One in which the projects delivered are positively impactful to business performance (Hilton & Sohal, 2012).

Successful project: A project in which the project objectives and are met, and there is adequate leadership involvement, fulfilment of the schedule, a change in the process, and sustained improvement or performance (Marzagão & Carvalho, 2016).

Sustainable program: One in which employees understand what tools and methods are effective for delivering the results they are seeking, employees have the autonomy to participate in improvement efforts and conduct projects following Six Sigma methods, and leaders expect employees to use Six Sigma methods to drive improvement (Suresh et al, 2012). De Mast (2007) provided that a successful and sustainable Six Sigma system is one that improves organizational effectiveness by creating the competencies of disciplined and strategic problem solving and conclusive decision making. Goh (2014) explained a sustainable program is one that retains relevance to the organization as strategic needs change.

Assumptions, Limitations, and Delimitations

Assumptions. The assumptions included in this paper are that the lessons from the research will be applicable to other manufacturing firms operating in the United States and United Kingdom and leaders of those organizations. Each organization has a unique culture and history in quality management systems; these are impactful to how well a system implementation is conducted. The culture of the organization studied, in regard to willingness to accept a quality management system, should be comparable to the cultures of other organizations that have experience with previous quality management systems or are regulated by a governmental agency.

Limitations. The limitations included are that the research is focused on one corporation and covers only a short period of time. A limited number of employees' experiences will be applicable to the study, limiting the sample size. Many of the leaders in this study have spent a

considerable amount of time at the company being researched and do not have experience in other organizations, contributing to a unique company culture.

Another limitation of the study is that the focus is on one company; however, the company is a large company with 95,000 employees globally. Although the study focuses on only one company, seven sites are included in the data collection. Additionally, an advantage that this company has that other companies may not is that there are Master Black Belts on staff with the organization at the time of the study who are focused on designing and executing a strategy for the deployment of the Six Sigma program. They have created training and considered communication needs within the company. The initial implementation has already been completed. Elements of the implementation will be discussed in the study to provide benefit for practitioners seeking to implement a Six Sigma system to a company. Also, this company is regulated by the United States Food and Drug Administration, which may motivate a focus on quality that companies not currently regulated by a governmental authority may not possess.

Delimitations/Scope. This study is focused on the problem of insufficient leadership support for a implementing a Six Sigma program within manufacturing facilities. The over-arching research question for this study is as follows: How can project managers gain adequate levels of support from leadership to successfully deploy and sustain a Six Sigma program? This study includes a literature review, interviews of Six Sigma practitioners, interviews of mid-level leaders, and a case study where employees of two manufacturing facilities for a large global manufacturing company were observed during problem-solving pursuits. The literature review will provide information on other critical success factors to system implementations and help establish a framework for deploying problem-solving systems.

Significance of the Study

The significance of the results of this study will be for the people seeking to implement Six Sigma in their organizations to experience a growth in understanding of what is necessary to heighten leadership support of the system. Through the influence of project managers, leaders who are not initially enthusiastic about the system will understand the value of the program, which includes achieving strategic objectives and improving profitability. When the leaders are educated on the strengths of the system, they can help guide the proper behavior by the employees and insist that Six Sigma project management methods are used to reduce waste in the system and drive profitability. Determining a successful implementation strategy will help organizations reap the benefits that this program has to offer regarding improved efficiencies and process improvement (Arif-Uz-Zaman & Karim, 2013; Oke, 2007).

A successful Six Sigma implementation spares the company from the expense incurred due to confusion and misapplication of tools and resources when implementations are not done well. Having a model available for business leaders and project managers to use to streamline implementation efforts aids by enhancing the effectiveness of activities. This study should provide insight into what practitioners should do to be successful in garnering leadership support when implementing and sustaining a Six Sigma program.

Leaders have a tremendous responsibility to seek out ways to ensure sustainability of the company and to improve profitability (Van Duzer, 2010). Included in this responsibility is an obligation to ensure implementations of programs and policies are effective and not a drain on profits. With programs such as Six Sigma, successful implementation extends beyond the initial introduction. Six Sigma cannot be considered successful if employees are not convinced of the value of the system and do not use the tools available to reduce wastes in the value streams of the business. This study explored what tasks project managers should pursue when attempting to

obtain necessary support from leaders to ensure the system deployment is sustainable. Often the return on investment from project work helps garner the support from the leaders of the company, which is important to a successful implementation. Knowing how to communicate the anticipated return well is an asset to creating a support network for the system. Communication between the project managers and leaders is an important component to a system adoption.

The information found through this study will benefit the broader community of project management because the same challenges in maintaining adequate levels of leader support are found despite the type of projects being executed. Also, since project management skills are beneficial to Six Sigma execution (Laux, Johnson, & Cada, 2015), leaders and Six Sigma practitioners should view project management as an important portion of their Six Sigma programs and training (Laux et al., 2015). Six Sigma project managers should have support from leaders for projects as well as training designed to enhance their project management skills.

Reduction of Gaps

Demonstrated methods for obtaining leadership support will help to close a gap in literature, because only critical success factors are currently defined. Project managers will profit from having a framework to follow when implementing quality systems (Kumar, Antony, & Tiwari, 2011; Moosa & Sajid, 2010). This study adds to the structures currently provided in literature by explaining methods or techniques to garner leadership support, which is explained by researchers as a critical component to Six Sigma system implementation and sustainment success. Project managers seeking to heighten leadership engagement and commitment will benefit from the information provided by this research as they work to implement and sustain their systems.

Implications for Biblical Integration

Project Management

Vision and strategy. The endeavor Nehemiah pursued to build a wall around Jerusalem is one of the guiding passages for project management in Scripture (Nehemiah 1-6). As any project should, the project to construct a wall began with a vision (Nehemiah 1-2). Nehemiah recognized Jerusalem's need for protection from enemies and the vulnerability the temple had for attack (Nehemiah 1-2). To assess the need and develop a solution, Nehemiah traveled around Jerusalem to understand the weaknesses and vulnerabilities of the city (Nehemiah 2:1-15), which is similar to guidance provided by the Six Sigma method to project management in which the problem solver is encouraged to visit the place of work to understand the problem to be solved. To the Jews, the temple represented continuity of worship, and security of the temple was important for the people. Through the vision God imparted on Nehemiah, the strategy of building a wall to protect the people and house of worship was created. God providing the vision and strategy first for the wall-building project informs project leaders and problem solvers that an initiative should not be pursued without first considering the relationship the endeavor has with the strategic objectives.

Well-laid plans. Prior to embarking on an initiative, plans should be well established. "For which of you, desiring to build a tower, does not first sit down and count the cost, whether he has enough to complete it? Otherwise, when he has laid a foundation and is not able to finish, all who see it begin to mock him, saying, 'This man began to build and was not able to finish'" (Luke 14:28-30, English Standard Version). Those who were unable to accomplish a task were ridiculed for the lack of ability to finish what had been started. Project managers today face the same pressures. As projects are initiated, project managers must take care to define the scope of work and the support network for the project. Included in this support group are business leaders

who make up the steering committee and serve in the champion and sponsor roles. The diligence project managers have in assigning leaders as sponsors and champions must be backed by support from these leaders for projects to be executed successfully.

Nehemiah sought God's will through prayer, which, for a project manager, would be akin to seeking the strategy or vision of the company leaders. He viewed the walls of Jerusalem to establish his plans to rebuild the city. The priests, rulers, and Levites all participated in Nehemiah's effort. He had their support. With their support and his persistence, Nehemiah successfully completed his effort in just 52 days.

Prayer. God laid the desire to pray on Nehemiah heart (Nehemiah 1: 5-11). Once Nehemiah recognized the problem that needed to be solved, he prayed for direction and wisdom. Only after praying did Nehemiah pursue the work to solve the problem. Christians should always seek God's path and will before taking action. Someone pursuing a solution to a problem should ask God for wisdom, direction, and guidance prior to determining what the solution is and for strength and courage to initiate and complete the determined solution.

Focusing on Influence. One of the most applicable and central biblical tenets that relates to this study is the criticality of influencing others. Project managers face the challenge of determining how to garner support from leaders, and Nehemiah faced the same trial, though the stakes for Nehemiah were much higher than the mere success of a system launch. The atmosphere during Nehemiah's time was hostile. Peacock (2009) summarized the events that led up to the enmity and explained how Nehemiah found success due to his strategic approach to acquiring support from the ruler of Persia before beginning his effort. Project managers can learn from Nehemiah's plight and resolve to influence important leaders to support his effort.

Nehemiah had to understand the volatile political environment of his time to gain the support of leaders and be effective in his rebuilding effort. The Babylonians destroyed

Jerusalem in 586 BC, David's monarchy had dissolved, the Jewish people had been exiled to Babylon or fled to the Egypt area, and the holy city was in ruins (2 Kings 24 & 25). When Cyrus became king of Persia, he began to allow people, including the Jewish exiles, to rebuild their worship systems and return to their homeland (Ezra 1-6). The Jews born in exile faced resistance from those who had remained in Judah (Ezekiel 11: 14-16). The effort to rebuild Jerusalem was tumultuous during the reigns of several leaders in the region because of fears the leaders had that the Jewish people may be working toward a rebellion (Peacock, 2009). Some leaders encouraged rebuilding, but others hindered progress.

When Artaxerxes became the ruler of Persia, he encouraged Ezra to train the Jews in Mosaic Law and begin an effort to rebuild the culture (Ezra 7: 6-11; Peacock, 2009). During this effort, the enemies of Jerusalem accused Ezra of fortifying the city in an attempt to rebel, leading to Artaxerxes' decision to halt the building effort and allowing the enemies to destroy what had been repaired (Ezra 4: 7-23; Peacock, 2009). When Nehemiah heard this, he was prompted to pursue the rebuilding effort (Nehemiah 1; Peacock, 2009). He could not be successful in his plans to rebuild the city without the backing from key leaders.

Nehemiah worked to gain support from Artaxerxes to resume the effort (Nehemiah 1:11). Through his leadership effort to talk with Artaxerxes and explain the benefits of the project, he obtained the authority to rebuild the walls. When Nehemiah faced opposition from the governor of Samaria (Nehemiah 2:10), the backing from Artaxerxes was critical (Peacock, 2009). As project managers pursue efforts, they must be diligent to understand the history or company culture that may obstruct their efforts and work to obtain the support necessary from leaders to avoid opposition due to jealousy, fear, or lack of understanding.

Commitment through adversity. Often, Six Sigma project leaders face resistance, opposition, and barriers to completing a project. They must have the persistence to move

through these obstacles and drive the right actions to complete the work. Nehemiah provides an example for how to deal with this type of adversity and continue the pursuit of the end goal (Nehemiah 4). Nehemiah faced mockery, much like many Six Sigma practitioners face, including sneering, opposition, and complaints from the very people he sought to help with the building of the wall (Nehemiah 4: 1-10; Nehemiah 6). Nehemiah prayed to God as he faced ridicule and found the encouragement to persevere. Project managers can learn from his example.

Leadership. Nehemiah demonstrated leadership in his project of building the wall. He was spiritually ready to take on the endeavor when God prompted him. He established a strategy and developed plans. Nehemiah was purposeful about his approach to understand the needs of Jerusalem and developed his message for the Jewish leaders carefully to convince them of the need for the wall (Nehemiah 2: 16-20). His tactics were successful and they agreed the wall should be built. Six Sigma practitioners must be prepared to embark on the large-scale effort of system implementation, develop a plan, and then explain the value of the project to garner leadership support.

The support Nehemiah provided enabled the people to pursue the right direction and accomplish the goal of the endeavor. His behavior demonstrates the enthusiasm, commitment, and loyalty company leaders and project leaders should emulate. He motivated the people to participate in teamwork as they built the wall (Nehemiah 4). He encouraged and edified the people (Nehemiah 4: 14). He understood the risks of the work, and took actions to protect the people and mitigate risks (Nehemiah 4: 16-23). He recognized the people were growing weary and assigned tasks properly to maximize the results of their efforts, rotating the workers between tasks and guard duty (Nehemiah 4: 21). Nehemiah also protected the people from oppression by the nobles and officials (Nehemiah 5: 1-19). From his desire to follow God's will to his devotion

for those he served, this full story informs Six Sigma project managers and leaders of how critical their roles are to successful initiatives.

Relationship to Field of Study: Project Management

Project managers struggle to successfully complete projects without adequate levels of leadership support. Leaders must serve in champion and sponsor roles for projects in order to drive enthusiasm for the initiatives and break down barriers that may hinder project success. Leaders must remain committed to projects throughout the efforts until completion. Project managers rely on support from leaders in each phase of the projects. This holds true whether the project is to implement a new computer software, build a new building, or improve a business process. Project managers will appreciate a framework to follow when striving to obtain leadership sponsorship, because the fact that leadership backing is necessary for project success does not guarantee adequate levels of support.

Roles of Project Managers

Project managers have various roles in the planning and execution of projects. Skilled project managers can work autonomously much of the time, but in each phase of a project and in each area of responsibility, there are opportunities for leaders to bolster the effort by engaging and demonstrating support. Sponsors do not own the tactical aspects of the project work, but can be enlisted to guide efforts, eliminate barriers, and increase enthusiasm for the work.

Project managers are provided a framework through the Project Management Institute (PMI) for project management practices to follow that include constructs for informing and engaging leaders. Included in these methods are defined roles and responsibilities of project managers. Project managers should be prudent to capitalize on typical project management practices that create opportunities for engaging leaders. Neither the responsibilities of project managers nor the defined structure for project management clearly define how project managers

obtain leadership support, but the foundation provided by the PMI and project management body of knowledge may provide a platform from which project managers can find success in fostering an environment for leader inclusion and engagement.

Project managers own project success. Project managers have ultimate responsibility for project success (Bowenkamp & Kleiner, 1987), but they must have leadership support for successful project execution. Leaders support implementation efforts by providing guidance, counsel, and resources. Project managers feel supported when leaders communicate the vision, help chart the path, set expectations, and establish measures. Project managers benefit from leadership engagement in many of the tasks ultimately owned by the project managers.

Planning and organizing. Project managers are chiefly responsible for determining what tasks need to be completed, in what order, and by whom. This activity takes place throughout the project. As more is known about the project, further plans unfold (Laufer, Hoffman, Russell, & Cameron, 2015). The planning activities within the project are critical for project success. The project manager benefits when the project champion helps establish plans and manage customer expectations.

Define the project scope. Project managers must determine what activities fall within the scope of the project. The customer to the project should inform this decision (Ireland, 1992). The project sponsor, champion, and steering committee can also play a role in establishing the project scope. The project manager must receive from the customer a well-defined list of measurable objectives and outcomes of the project work. From this information, the project managers can refine the scope. Project managers need business leaders to support this activity and participate in the effort.

Contract third parties. The project activities may require support from external resources, or the project manager and business leaders may determine certain activities will be

better supported through third parties. Sometimes it is necessary to outsource activities to ensure a project will be completed on time (Karlsen & Gottschalk, 2006). Project managers must be capable of selecting and managing contractors (Karlsen & Gottschalk, 2006). The work assigned must still be completed according to schedule and the expenses related to the outsourced work should be properly managed. Project managers need leaders to support their decisions to hire contractors when necessary.

Setting direction and expectations. Project managers must demonstrate a strong aptitude for leadership. In the leadership role of project manager, one must establish and communicate roles and responsibilities (Anantatmula, 2010). The expectations within the roles and responsibilities must be explicitly identified and communicated (Anantatmula, 2010). The project manager must guide the team and communicate how effectively the project team is achieving project objectives. When the team is off track, the project manager must be skilled at redirecting the team and guaranteeing the course is promptly corrected (Bowenkamp & Kleiner, 1987). When project managers face challenges with team participation and performance that they cannot correct, they need support from leaders to resolve the issues.

Communicate to leaders. Successful project managers communicate to leaders effectively, ensuring they are kept informed on project progress and barriers (Bowenkamp & Kleiner, 1987). Business leaders need to know that a project is on track and will deliver to the expectations of the customers. Keeping leaders informed ensures they can continue to champion the effort by building enthusiasm for the results, or step in to help remove barriers to success. Though the project manager often must address barriers to keep the project on track, there are times when high-level leaders must be engaged to guarantee forward momentum of the project work.

***Controlling*.** Project managers are tasked with ensuring a project remains on course. Through tracking progress and measuring the impact of activities, project managers can gage how effective the project team members are at accomplishing assigned tasks. If a project does not remain on course, the project manager is charged with knowing what actions to take to make sure the project recovers. If the project manager cannot make corrections without escalating to the project champion, the project champion must be notified immediately. The support of the project champion is critical to ensuring project success. If project managers do not have adequate levels of leadership support in this area, they will struggle to achieve project success.

Challenges to Achieving Support

Project managers who choose to use Six Sigma statistical tools and Lean principles often work in an environment where many of the business leaders do not understand the tactics used to implement solutions and complete projects. This lack of understand can hinder the commitment leaders are willing to provide to project managers working within the system and project managers working to implement a system into an organization. There may be additional reasons that commitment from leaders may wane. Project managers may benefit from a structure to overcome these barriers and enlist and maintain the needed backing.

A Review of the Professional and Academic Literature

Business leaders are continually faced with the challenge of ensuring their companies remain viable in the market. Many aspects of the business must be considered and addressed, including time-to-market measures for product development, innovation, cost management, and talent development. Project managers are often called upon to champion efforts to improve outcomes in these arenas, because project management methods have been proven to positively impact business performance and longevity (Zagorsek et al., 2017). Project managers have a diverse skillset that allows them to be effective in each of these areas of focus, even though the

function within each concentration is different. The methods project managers follow are applicable, independent of the topic of the initiative. The versatility of project management methods have helped demonstrate the value and pliability of the craft to business leaders.

The adaptability of project managers and their skillset is advantageous for delivering successful endeavors in varying functional departments. When business leaders recognize this strength and enlist project managers to methodically improve efficiencies in significantly impactful business functions, they are able to capture substantial gains in market competiveness and customer satisfaction. Once a well-structured approach for choosing and tracking projects is implemented, business leaders can assign projects strategically to achieve strategic objects.

A challenge for business leaders is that managing with a project management focus is a shift from historical methods of managing corporations. Introducing this approach can be much like implementing a new management system. System introductions can be perplexing, as they present change and managing change can be a challenge. Leaders must maintain commitment and focus to ensure these conundrums do not derail the overall effort. The need for their support does not cease to exist once employees accept the change. Leaders throughout the organization must support each project initiative to sustain the management system.

When a leader decides to institute a system within an organization, a structure should be established for the implementation. An implementation of a program can be considered a success when employees understand what tools to use to accomplish the work, what work should be pursued, and how to verify through performance and financial indicators that their work is achieving strategic objectives. Leaders of companies own each of these elements and should ensure employees are prepared for the change and equipped to succeed in the new system.

Leaders must also ensure properly trained employees are in well-suited positions to accomplish the work. For a Six Sigma system to flourish, trained project managers must be in

place to ensure strategically significant projects are chosen and successfully executed. When business leaders successfully integrate project management methods into the organization at a level where these tactics become the techniques used to manage the business, the performance of the organization improves (Kezner, 2009). Leaders must be actively engaged throughout the implementation, and continue to provide support to ensure sustainment.

System implementations are complicated endeavors. There are many factors to consider when introducing a system in an organization, and strong leadership is required, which is true no matter what type of system is being introduced to an existing organization. Most system failures are caused by ineffective implementations (Moosa & Sajid, 2010). Successes and disappointments of system implementations typically involve social aspects of organizations, such as context, history, competence of employees, leadership style, process discipline, priorities, and turnover rates (Moosa & Sajid, 2010). Often these elements of implementations have been overlooked because leaders were focused on technical components (Moosa & Sajid, 2010). When leaders neglect these important factors, system failures or delays in the implementation can result (Moosa & Sajid, 2010).

Leaders must participate consistently to ensure that a system is well implemented and sustained. Leaders must first ensure the system is successfully implemented. Then they must challenge employees to pursue the most impactful work. When endeavors well linked to strategic business objects are pursued, business leaders see the performance of the organization improve.

Efficiency Improvement Projects

Project management methods help project managers to implement streamlined processes and systems that reduce costs and improve proficiencies. The results of these endeavors include improved response times, reduced resource investments, and enhanced quality. Business leaders

have realized these results allow them to capture greater market share and improved revenues. One specialized system of projects that has proven effective in this arena is Six Sigma.

Six Sigma is a system that is typically made up of multiple strategically-focused projects. These projects can be focused on any business process, including product development, process design, production operations, logistics, inventory control, and finance management. When a Six Sigma system is well deployed, a business can reap substantial financial benefits. Ironically, though this has been proven, many business leaders have struggled with determining effective strategies for deploying quality systems that are successful and sustainable.

Six Sigma implementation efforts are often conducted as projects, and the project managers, or Six Sigma practitioners, are tasked with influencing others to see the importance of the system and accept responsibility for ensuring the objectives of the system are met and supported. Without direct authority over the people who should commit to the program, project managers may struggle to convince them to buy into the system at a level necessary for success. When the key stakeholders, such as organizational leaders, do not commit to the system or commit to supporting projects pursued within the system, the overall system is not likely to be sustained. The project manager may successfully make it through enacting the system, but the implementation project could ultimately fail because of a lack of an effective strategy for ensuring on-going support for projects pursued within the system. Also, within the construct of a project-focused quality system, leaders must have the capacity to support each project endeavor pursued within the system. Without ongoing support, the system will ultimately falter and fail.

Project Managers Strive for Leadership Support

Leadership support is a critical success factor to system implementations (Chou, 2014), but systems often fail because there is not adequate support from people in mid-level managerial roles. The challenges in garnering support for the system from the key leaders and stakeholders

can be improved if the top leadership provides backing for the system and insists that the employees commit to it. High-level leaders must hold all employees, including those in mid-level leadership positions, accountable for using the system and supporting the project managers within the system for it to be successfully implemented and sustained. If leaders at all levels do not provide backing for the projects within the system, the system will not be sustained.

A challenge for those working to succeed at leading projects and driving improvement for the organization is there is no framework that suggests how much achievement must be attained in the system before leaders will be convinced the system is beneficial to the competiveness and longevity of the organization. In addition, there are no suggestions for how project managers should communicate the wins gained through the use of the system such that those not involved in the system believe that the tactics used to realize those gains can be accomplished in their areas. There is no suggested construct for garnering the support of leaders.

The factors that determine the success of system implementations should be explored to comprehend the key elements that should be managed by those working to employ a new structure. These employees should then consider the organization's current maturity levels on those topics. If the maturity levels can be developed, the individuals introducing the system should attempt to enhance the factors contributing to the maturity levels. If not, the employees implementing the system should seek to mitigate the risks and barriers introduced by the weaknesses imposed by limited maturity in critical success factors of system implementation. Ideally, these individuals would have unwavering support from leaders in positions of authority as they work to either elevate maturity levels of success factors or mitigate the risks and barriers to successful system implementations. If those charged with system implementation face a lack of leadership support, they have a significant barrier to overcome in the deployment effort.

When successfully deployed, Six Sigma systems can be used strategically by business leaders to improve business performance through a statistics focused, project-based approach to reducing costly wastes and errors (Goh, 2002; Kavčič & Gosnik, 2016). Businesses seeking to reduce errors and improve efficiencies can be managed with a Six Sigma focus, which ensures the efforts most impactful to customer expectations and business performance are pursued and successfully completed (Thomas, Barton, & Byard, 2008). Though this method has been proven in many industries, many corporations have failed to implement these systems due to insufficient levels of leadership support.

Six Sigma requires leadership engagement. Six Sigma requires leadership involvement (Antony, 2009; Eckes, 2003). If Six Sigma project managers can find ways to highlight the financial gain of the system in a message leaders can clearly interpret, the practitioners may gain enough support to deploy the system successfully. A gap that remains in literature is that Six Sigma project managers are not provided a universally proven strategy for obtaining leadership support. Also, it is still unclear how much leadership commitment can be obtained through demonstrating the value of the statistics-focused project management system.

Leaders support project managers. The Six Sigma system brings unique aspects to organizations. The system focuses on metrics to drive progress through projects focused on improving progress to goals and document monetary savings generated from improvement activities (Schroeder, Linderman, Liedtke, & Choo, 2008). The metrics and savings can serve as motivation to the employees to use the system and for the leaders to support it. These are important elements to highlight during implementation so that all stakeholders understand why these tracking tools are significant to the system. The metrics, when used appropriately, communicate progress, show where additional efforts are needed, and reveal when teams have realized success in the system by saving money or resources. Leaders can capitalize on the

information provided through metrics and trend charts to recognize employees for jobs well done and communicate where additional efforts are needed.

Obstacles Project Managers Face

Project managers can face a myriad of challenges throughout the course of project execution. Skilled project managers can navigate through some of these challenges without the success of the project being jeopardized, but some of the obstacles could be worsened by lack of leadership engagement. Chen (1997) lists these challenges as (a) inadequate resources, (b) unrealistic deadlines, (c) unclear direction, (d) uncommitted or distracted team members, (e) insufficient planning, (f) communication barriers, (g) changes in goals or resources, and (h) conflicts between departments and functions. When project managers communicate that there are behaviors or circumstances posing risks to projects that they cannot mitigate, the project manager would be most benefited by prompt action by organizational leaders. Additionally, if the functional leaders were engaged in project efforts from the beginning, some of these barriers to project success may not surface.

Obtaining adequate leadership support is not always as easy as requesting it. The overall organizational climate and the individual values of the leaders impacts the likelihood that project managers will be able to influence leaders to commitment to projects (Gattiker et al., 2014). Leaders have many demands on their time and have limited resources to assign to priorities. The theory of constraints explains that leaders must decide what is the most important work, and strive to remove barriers to accomplishing goals (Goldratt & Cox, 2004). Project managers must find effective ways for helping leaders understand Six Sigma can be beneficial in removing those barriers, and Six Sigma is not just another passing priority. With strong leadership support, Six Sigma can aid leaders in removing barriers and accomplishing goals. Commitment from organizational leaders is a critical success factor to project success (Gattiker et al., 2014).

Project managers need to know how they can be successful obtaining necessary levels of leadership support for project work to be successful, and, in order for leaders to provide this support, leaders need to understand why the project work is beneficial to achieving organizational goals.

Successful and Sustained Systems

Project managers implementing the Six Sigma system understand the system is merely an avenue for driving improvement using the system's tools and methods, not a guarantee they will be used. Project managers must strive to find ways to ensure the system will be employed in problem solving efforts. The employees need to know that leaders expect that they use the tools (Antony, 2014). They also need to know using the tools is beneficial to the business and will help strategic objectives to be met (Antony, 2014). Project success is dependent on adequate and timely communication (Brun, 2011). When employees understand the benefits and that leaders expect engagement, they are more likely to adopt change.

To heighten system adoption, employees should understand clearly how projects link to strategic objectives and how using Six Sigma methods in their projects will contribute to successful project completion (Antony, 2014). Project managers can strive to influence employees to use the system, but much more benefit can be gained if project managers can convince business leaders to provide adequate messaging. Project managers depend on business leaders communicating the importance of using the tools in improvement projects and holding employees accountable for applying the techniques provided by Six Sigma. Otherwise, a Six Sigma implementation will not be successful or sustained. High levels of communication and precise explanations of expectations help an organization through the process of change (Kotter, 2017).

Experience with quality systems. An advantage companies who have previously pursued quality management systems have is that the employees are less intimated by Six Sigma being introduced in their organization if they have had prior experience with quality management systems (de Carvalho, Lee Ho, & Pinto, 2014). Employees who have experienced quality management systems are familiar with some of the tools used in Six Sigma and have an understanding of what will be required of them in the system (de Carvalho et al., 2014). As they learn about Six Sigma, they can see the links between the systems and understand the connections and overlaps. They also have the opportunity to see where Six Sigma complements the systems previously, or currently, used to drive quality and how Six Sigma adds strength to the organization's efforts to produce quality products and services through a statistical approach. The leadership support required for a successful implementation and on-going sustainment may be less involved than for organizations who have not previously embarked on a quality management system adoption.

Skilled project managers. Six Sigma deployments often include dedicated specialists to run or support the program (Schroeder et al., 2008). These specialists are well trained in the system's tools and methods (Hilton & Sohal, 2012). They have the knowledge necessary to train the employees and lead the system. These individuals are crucial to the success of the system because they can educate the employees on the benefits of the system and how to use it (Hilton & Sohal, 2012). They are also skilled at project management and teach employees these methods, which heightens the success of achieving Six Sigma deliverables. These individuals know how and when to communicate project status to leaders and are capable of escalating the barriers and risks appropriately. They also lead the projects that address the most complex problems that the organization faces (Hilton & Sohal, 2012).

Communicating value. Project managers should be instructed on how to communicate value for the system to educate leaders on why they should champion implementation efforts. Multiple methods are available to project managers, but none have been defined as highly correlated to successfully achieving leadership sponsorship. By teaching and mentoring others, Six Sigma project management professionals build strength and generate activity in the system, but they do not necessarily rally the support of leaders through these actions. Through executing their own project initiatives, they contribute to the success of the program by reducing errors and costs. When communicated effectively, these achievements may be beneficial in swaying those not involved in the system to believe Six Sigma is a worthwhile endeavor. A communication plan for explaining the gains achieved through training, mentoring, and executing projects may be beneficial to attaining leadership engagement and support. How Six Sigma practitioners can influence employees and leaders to engage fully through the use of communication tactics is unclear.

Projects in phases. Phase gate meetings may provide structure for project managers to obtain leadership support. Those leading an initiative to implement a Six Sigma system must adhere to project management constructs to influence the expectations of stakeholders, resolve issues, and address concerns (Project Management Institute, 2008). Project management methods strengthen the likelihood that projects will be implemented successfully and that stakeholders will accept the objectives of the project (Rapaka, 2017; Project Management Institute, 2008).

A phased approach to project management with periodic updates to stakeholders helps project managers deliver successful projects through providing an opportunity to shape expectations and manage concerns (Rapaka, 2017; Project Management Institute, 2008). Project managers must be skilled in delivering the requirements of each phase timely and keeping

leaders and stakeholder informed on progress. Not only do phase gate meetings provide project managers an opportunity to communicate successes of the implementation, but they also provide a forum for leaders to be advised of actions needed from them to reduce barriers and champion the effort.

Through the constructs of project management provided by the Project Management Institute, project managers should schedule meetings when transferring from one project phase to the next to keep stakeholders informed and receive approvals to proceed to the following phase (Rapaka, 2017). The phase gate review schedule allows the stakeholders an opportunity to voice concerns and questions for Six Sigma system implementations and the projects within Six Sigma. The cadence of phase gate reviews allows for the communication between the project team and stakeholders that is critical for project success. In this structure, leaders are afforded the opportunity to ask questions, gain clarity, and understand each phase of the implementation effort. Capitalizing on project management methods that are proven may enable project managers to find success in obtaining leadership support.

Quick wins. Project managers who can achieve and demonstrate quick wins through the Six Sigma system may have an increased ability to obtain leadership support. Leaders who are provided evidence that the system is valuable may be more supportive of the system (Eckes, 2003). An obstacle project managers face with garnering leadership support through proving the system is valuable through providing quick wins is that leadership support is necessary for quick wins to be accomplished. Thomas et al. (2014) explained some organizations experience difficulties employing Six Sigma because of a lack of focus, competing priorities for Black Belts' time, the number of responsibilities owned by each employee, and the senior leaders not realizing there is low-hanging fruit available. Low-hanging fruit is a reference to the fact that there are improvement initiatives that can be achieved by working through the DMAIC method

without much time investment, but can still build enthusiasm for the program (Eckes, 2003). When these initiatives are quickly achieved and the success is communicated to business leaders and stakeholders, project managers striving to implement the system may make strides in building a case for the value Six Sigma provides, thus reducing some of the barriers to implementation (Eckes, 2003). The challenge project managers face with using this tactic is determining how to accomplish the improvement in spite of waning leadership support.

Critical Success Factors to Implementation

Critical success factors for systems to be successfully implemented and sustained are identified in literature. In a study where critical success factors were highlighted in surveys conducted of organizations that have implemented the system, the following eleven factors were identified: (a) leadership engagement and commitment, (b) cultural change, (c) organizational arrangement, (d) training, (e) project manager aptitude, (f) project ranking and choice, (g) project review and tracking, (h) understanding the Six Sigma methodology, (i) links to business strategy, (j) links to consumers and customers, and (k) links to employees and suppliers (Antony & Banuelas, 2002). The most important success factor for the surveyed firms was involvement and commitment of top leadership to the program (Antony & Banuelas, 2002). Similarly, Brun (2011) reviewed 18 academic articles and found leadership involvement and commitment, culture, change management, communication, infrastructure, training, linking to strategy, connecting to customers, linking to suppliers, and linking to human resources, project management skills, project selection and prioritization as items repeatedly cited as critical success factors of a Six Sigma program. Swami and Prasad (2011) found critical success factors of a Six Sigma program to be leadership and work culture of top management, implementation of an effective process management system, well-developed strategic planning processes, statistical

tool training for all employees, ties to customer satisfaction, proper use and understanding of voice of the customer feedback, and a full integration with human resources.

In the same way, Ho, Chang, and Wang (2008) found the following to be critical success factors to implementing a Six Sigma system: top leadership commitment and participation, customer focus, an adequate Six Sigma framework, project execution and result follow up, an investment of essential resources, a training framework for trainers and mentors, reward systems, data analysis, data that are easily attainable, long-term and short-term focus, knowledgeable leaders, project links to business strategy, communication, cooperation, and use of Six Sigma tools. In contrast to the studies naming leadership support as the most critical element to project success, Kornfeld and Kara (2013) found that project selection and prioritization were the most critical components to Six Sigma program success. The comprehensive list of critical success factors is valuable to the practitioners implementing systems. The information provided through the research cited educates Six Sigma practitioners that leadership support and project selection are imperative for system success. If these elements are present, the system implementation is likely to succeed and be sustained. A challenge for the practitioners is that these factors may be difficult to achieve and manage.

Project managers should understand which success factors are priorities to achieve and how a strategic implementation might be structured to include the proper features at the most advantageous times. Maybe there is a combination of factors that should be developed originally, and, once maturity or success is demonstrated for those aspects, others can be pursued. It is not likely the project managers can grow each component simultaneously and to equal levels of maturity, due to resource and capacity constraints. Information guiding the project managers to develop metrics or goals for maturity could help the practitioners to know how to be successful in the system. Identifying the areas of focus for a successful and

sustainable system is a starting point, but further evaluation into how to elevate the maturity of each factor would be valuable to the practitioners as they strive to implement Six Sigma systems successfully.

Top leadership participation is a factor that is repeatedly named in literature as an element critical to system implementation. Knapp (2015) considered leadership involvement, statistical methods, and effective organizational infrastructure as key components of implementation. Gutierrez, Leeuw, and Dubbers (2016) and Miguel and de Carvalho (2014) explained managerial involvement and organizational commitment are imperative for successful implementation. If the leaders understand how essential they are to the success of a project management system, they may be more likely to seek opportunities to engage and support the system.

A challenge for the project managers is that the top-level leaders often outrank them and mid-level leaders report through a different reporting structure, or have clear deliverables that can be achieved without the use of statistical tools, at least for a period of time. An outline of how Six Sigma project managers should communicate to the senior leaders that they must support the system by insisting all levels of leadership demonstrate improvements through the use of the system would be of great value to the practitioners attempting to facilitate the system implementation. When mid-level leaders are not required to take specific action, they tend to focus their energy on what is required of them, such as achieving production volume requirements.

Marzagão, Lopes, Gouvêa, and de Carvalho (2014) found critical success factors different from top leadership support. Marzagão et al. (2014) explained critical success factors for implementing a Six Sigma program are the organization's quality culture, employee involvement, project selection, and training and learning. Interestingly, most of the companies

that adopt Six Sigma have a mature quality culture, as previously mentioned, so this success factor should be often achieved in companies seeking success with deploying Six Sigma. Also, top leadership commitment and support is crucial to successful system implementation and sustainment. Perhaps leadership commitment can be enhanced if leaders are advised of the additional deliverables that Six Sigma can provide that were not introduced using the previous quality system.

Suggestions for Successful Implementations

Leadership participation and engagement is imperative for successful projects. Literature provides information on leadership behaviors and project management methods, but project managers are not provided details on how to obtain leadership support. The behaviors of project managers may be important for leaders to know how they are needed and what actions they should take to back projects appropriately. Project managers must be diligent to perform well in the activities they own and use project management constructs to gain leadership support. In each project management responsibility, project managers can find opportunities to engage with leaders.

Prudent project management. Project managers have the responsibility of successfully executing projects. A project to introduce and deploy a system can only have the opportunity to succeed when managed with judicious project management practices (Nasir, Sahibuddin, Ahmad, & Fauzi, 2015). These practices include deliberate steps in initiating, planning, executing, and closing the project (Nasir et al., 2015). Diligence to each phase and all responsibilities of managing a project enables a project manager to methodically structure and complete an implementation effort while keeping all stakeholders informed on progress. Leaders should be informed on what champions should do in each phase of the project. Project managers

not only own the successful execution of each phase, but also engaging leaders appropriately. They should not assume leaders know how to support a system implementation.

Purpose and scope. The project manager leading a system implementation effort must clearly define the purpose and scope of the project (Little, 2011), and work with the project champion to refine them. The scope of the project will be informed by the expectations of the customers to the project, including the champion. The expectations of the customers must be clearly defined and converted into measurable and realistic objectives (Little, 2011). A statement of work is a tool that can be used to define what must be accomplished with the project to meet the needs of the customers to the project (Somasundaram & Badiru, 1992). If the project champion has specific requests of the project, he or she should be party to the statement of work development and his or her expectations should be documented clearly. Using project management tactics such as this may help leaders understand better the value that will be provided by the implementation, which could lead to their support of the implementation.

Team and training. A team must be created to deliver the requirements of the project, and the project manager may need to seek approval or guidance from the champion to solicit employee participation as team members. The project manager should draft a project team and clarify roles and responsibilities (Little, 2011; Project Management Institute, 2008). The tasks to be accomplished by the project should be considered when determining who will fill the project team member roles. The skills of the team members should guide the project managers when determining which team member to assign which tasks. If there are any gaps in skillsets or abilities, the project manager may need to create and execute a training or development plan for the team members needing development. The team should clearly understand roles and responsibilities, as well as the timeframe in which actions must be completed to keep the project on track to the schedule. Business leaders may need to approve the training efforts.

Support for risks and barriers. The project manager has the responsibility of identifying and mitigating risks to project success. All risks to the projects should be named and a plan for managing the risks should be put in place (Little, 2011; Somasundaram & Badiru, 1992; Project Management Institute, 2008). If risks cannot be managed by the project manager, he or she should escalate the issues to the project champion for assistance. Leaders may appreciate being brought in to address barriers to a project, and the suggestion that they have the authority and capability of doing so may work toward garnering their support of the overall initiative.

Ability to champion. Literature teaches that a successful implementation requires leadership support. Project managers leading an implementation should be informed of the criticality of this support and understand how to identify both the capability and willingness of organizational leaders to support the endeavor (Eckes, 2003). As the project manager works to identify risks to the implementation effort, he or she should include areas where a gap in ability to champion the initiative exists or lack of willingness to engage in the endeavor. For these risks, the project manager should determine mitigation steps and responsible parties. If any of the identified risks become known issues, the project manager should make his or her project champion or sponsor aware of the potential impacts to the implementation. Since the project manager is accountable for success of his or her endeavor, he or she should know what leadership behaviors are necessary for adequate support. If the leaders that will be a party to the implementation effort do not have the capability to support the project, the project manager will face challenges in successfully completing the system implementation (Eckes, 2003).

The project manager owns managing the expectations of customers to the project and those who will be impacted by the effort (Project Management Institute, 2008). If leadership capability gaps exist, the project manager may be able to guide leaders in actions required to please customers. The project stakeholders and customers must be identified and managed

throughout the project (Little, 2011; Project Management Institute, 2008). Timely and thorough communications should be provided. A detailed communication plan should be developed to ensure the proper message is provided to the appropriate audience at the right time (Somasundaram & Badiru, 1992; Project Management Institute, 2008). Leaders are best suited for communications related to change management, and project managers may be successful assigning specific communication tasks to leaders who do not know what to communicate, to whom, and when. The project manager will schedule and conduct project meetings and ensure the communication plan is executed (Little, 2011). A challenge for project managers who have to prompt business leaders to engage and complete specific actions is that managing leaders at this level is time consuming, and compliance of the leaders who are willing to complete the actions is not the same as enthusiasm to champion an effort. Simple completion of the tasks may not be what literature means by leadership engagement and support.

Managing expectations for support. Leadership expectations can be managed with the appropriate levels of communication. The project manager should report out to senior leaders at an established cadence, escalating risks and barriers as appropriate (Little, 2011). The project manager must manage leader expectations, and, in doing so, he or she may be able to garner the leadership support necessary for a successful implementation (Nasir et al., 2015).

Communicating through a plan. Leaders who are included in the development and communication of a project plan may be more inclined to support a project than those who are not. A project plan, including activities required and the costs, must be developed to ensure the project manager has visibility to critical elements of the project (Little, 2011; Somasundaram & Badiru, 1992). A project timeline should be created and shared with the parties involved, especially leaders associated with the effort (Little, 2011). A work breakdown structure provides more details than the timeline and servers as an effective tool for managing schedules, cost, and

performance (Somasundaram & Badiru, 1992), and can help communicate what the project requires. This information can help leaders see where they should engage to help an initiative be successful, particularly when shared in phase gate meetings where barriers and risks are communicated. When all of the elements of a project are well managed and communicated, the implementation effort has a chance for success.

Support at all levels. All levels of leaders have a responsibility to a project focused on implementing a system. Project managers must communicate the expectations they have of the leaders throughout the implementation effort if they expect to have their support. Top-level leaders must be supportive and mid-level managers must encourage the use of the system. First-line managers must participate in the use of the system and challenge the employees who fail to use the system. Assarlind and Aaboen (2014) and Eckes (2003) found there is a positive impact when leaders take an active role in seeking out Lean Six Sigma as a solution to quality issues.

When leaders contribute to the selection of the program and employees are well trained, there is more benefit to the implementation than when individual managers are the only contributors who are knowledgeable about Six Sigma (Assarlind & Aaboen, 2014; Kumar et al., 2011). Leaders should establish training plans for employees to ensure they are competent in using the tools and techniques in the system (Kumar et al., 2011). Project managers must be diligent to develop a communication and training plan to prepare leaders for their roles in a system implementation. They should also highlight gaps in leadership support of the implementation project to the project champion if the waning backing poses a threat to success.

As Kotter (2017) explained, leaders must engage and take deliberate actions to support a change. During a Six Sigma implementation, all levels of leadership must be in tune with how employees feel about the system and changing to a new method of business. They must address concerns and strive to educate employees to pave the way for the change. The skill sets of

influencing and motivating others are valuable to this effort. Knapp (2015) explained, "If managers understand the quality initiative cultural underpinnings and are attentive to the influence of culture-shared values and norms, then the initiative is more likely to succeed" (Knapp, 2015, p. 2). Project managers may find they must guide and influence leaders to participate in this manner. If project managers determine leaders in the organization do not have the ability to connect with employees in this way, they should determine what actions should be taken to correct the issue or mitigate the risks to a successful implementation.

Project managers leading a system implementation need leaders to champion change as Kotter (2017) defined and should expect leaders to be supportive of the Six Sigma effort, make decisions consistent with the initiative, and create open dialogue about the system implementation (Knapp, 2015; Eckes, 2003). The more supportive leaders are of an initiative and the employees working within the initiative, the more likely the employees will focus on innovation and be comfortable taking intelligent risks. An endeavor like implementing Six Sigma has a greater likelihood for success when it is supported powerfully by the business' leaders (Eckes, 2003). When project managers find this level of leadership is not being displayed, they should attempt to correct course and protect the implementation effort. Because engagement of the leaders is imperative to project success, project managers should aggressively pursue remedies to deficiencies in leader involvement.

Effective leadership behaviors for Six Sigma implementations were defined by Suresh et al. (2012), and they include: (a) working effectively with colleagues, (b) effective and efficient pursuit of predefined objectives, (c) provision and pursuit of a clear and compelling vision, (d) commitment to the system, (e) humility, (f) professionalism, (g) leadership momentum, (h) leadership knowledge of economics, (i) disciplined leadership action, and (j) disciplined leadership thought. The behaviors of leaders impact the success and longevity of a system

implementation, but Six Sigma practitioners do not typically have the authority to directly impact leadership behavior through merit ratings or performance evaluations.

Project managers leading large-scale initiatives must find ways to influence leaders and guide them toward demonstrating the behaviors necessary for creating an environment conducive for adopting change. Project managers may lean on project management practices and assemble the leaders to ask what they expect of the implementation effort. This type of discussion would provide a project manager an opportunity to explain the expectations he or she has of the leadership group.

Project managers assess competencies. Project managers striving to gain the support of leaders should have the ability to assess the aptitude of leaders to demonstrate appropriate backing. Moosa and Sajid (2010) suggested leadership support includes leadership competencies. For leaders to provide adequate levels of support for a Six Sigma system implementation, their core competency in statistical and analytical tools must be upgraded and they need to be able to use and understand the statistical software used in the company for the purposes of Six Sigma (Moosa & Sajid, 2010; Thomas et al., 2008). Project managers implementing Six Sigma should insist that leaders participate in Six Sigma training to learn about the statistical tools, and if they are not willing to devote the time necessary for effective training, the company is not ready to implement a Six Sigma program (Kumar et al., 2011; Enoch, 2013; Eckes, 2003). If this is the case, the project manager owns notifying the implementation project champion right away.

Project managers create structure. Project managers implementing a Six Sigma system must develop controls for ensuring ongoing leadership support. In addition to providing support for the implementation of the Six Sigma program, leadership backing and involvement is necessary for successful Six Sigma projects (Sunder, 2016). The sponsors of projects should be

members of upper leadership (Sunder, 2016). Champions should be the senior leader of the area where the project work will be focused (Sunder, 2016). These two members of the project team are important to realizing successful projects because they inform the project manager of where there may be risks to the project work from outside the scope of the project, work to align other leaders on the importance of the project work, and remove barriers for the project manager (Kloppenborg, Tesch, & Manolis, 2014; Gattiker & Carter, 2010). A program in which successful projects achieve the strategic objectives of the business will be successful at providing improved profitability and sustainment to the business (Parast, 2011). However, literature does not make clear how Six Sigma practitioners can convince mid-level leaders that their involvement in projects is imperative. Additionally, literature does not explain if leaders of the areas in which the project work is being pursued own the success of the project, or if the Six Sigma community does. Potentially, an ownership decision could aid Six Sigma practitioners in garnering the levels of leadership commitment necessary for ongoing system support.

Identifying gaps in knowledge. Though research is available to show the high correlation between leadership support and system success, there is not clear direction for how this should be communicated to the leaders. Even if Six Sigma project managers attempt to inform the leaders how valuable their involvement is, there is still a gap of explaining how the leaders should support the system. Arcidiacono, Costantino, and Yang (2016) suggested a maturity model could be used by project managers implementing a system to evaluate leadership competencies as part of an assessment to gage a company's readiness for system deployment. Six Sigma project managers could attempt this type of assessment to highlight gaps in knowledge or capabilities. But two gaps still remain in correcting inadequacies in ability: finding a method to provide the needed education and determining if the system implementation must pause until the education is provided.

Project managers should educate leaders on all the elements of support that are required for a successful implementation to increase the chance for adequate levels of support. Sharma and Chetiya (2010) expanded on the idea that leadership support is critical for project success and explained that leadership commitment alone cannot ensure the success of Six Sigma deployments. Leadership commitment must be accompanied with a good communication plan, workflow management, measurement information systems, and resources (Sharma & Chetiya, 2010). While leadership commitment is important, other essentials must be required of the leaders by the project managers implementing the system.

Capitalizing on leadership types. Project managers introducing a system should understand the different types of leaders, so they can better equip them to lead the change through training, mentoring, or coaching programs. Battilana, Gilmartin, Sengul, Pache, and Alexander (2010) explained that leaders who possess task-oriented skills are well-equipped to lead initiatives related to organizational structure, design, and control. These skills are necessary to attain organizational goals and design change initiatives (Battilana et al., 2010). Person-oriented skills are those that create a social climate, promote management practices, and ensure equitable treatment of employees (Battilana et al., 2010). These skills are critical to plan organization change (Battilana et al., 2010). They help leaders to motivate and direct followers (Battilana et al., 2010). Leaders must communicate the lead for change, motivate employees to engage, and track the progress of the change (Battilana et al., 2010; Kotter, 2017). The leaders who are more effective at task-oriented behaviors are more likely to focus on mobilizing and evaluating (Battilana et al., 2010). Coaches and mentors can be employed by project managers to help build these leadership attributes where they may be lacking.

Project managers as leaders. Project managers may need to step into a leadership role to guide employees and leaders through an implementation to ensure project success. Though

this would be an unofficial leadership role, the project managers can demonstrate the attributes necessary to engage the employees. Bolden and Gosling (2006) provided that effective leaders are successful at rallying participation, development, and commitment of others within the company. The effective leader can energize others and express the corporate vision in a way that employees engage in the cause (Bolden & Gosling, 2006). Operational leaders are good at communication, problem solving, people management, self-awareness, evaluation of others' needs and desires, information processing, project management, customer service, delivery, business and political acumen, and execution (Bolden & Gosling, 2006). They like being challenged and they are prepared to take risks (Bolden & Gosling, 2006). Project managers can work to influence others by demonstrating these behaviors to lead the charge. Though these tactics may be beneficial to an extent, project managers working to implement a system will be strained if they must also cover roles leaders should play. At some point, they will need to gain the support of the leaders.

Understanding emotional intelligence. Project managers may find more success in project execution if they have the ability to identify the leaders who are best suited to champion their efforts. Leaders with higher levels of emotional intelligence may be best equipped to partner with project managers responsible for large initiatives. Batool (2013) provided that emotional intelligence levels are positively correlated with employee performance and engagement. Kerr, Garvin, Heaton, and Boyle (2006) explained a leader's emotional intelligence level is a key determinant of his or her effectiveness as a leader. The higher the emotional intelligence level of the manager or leader, the more successful the implementation.

When a new system is being implemented in a company, it is imperative that the employees engage in the process and have the desire to own the system. Charismatic and visionary leaders are effective in leading the employees through the change (Canato, Ravasi, &

Phillips, 2013; Prati, McMillian-Capehart, & Karriker, 2009). Leadership behaviors have high impact to the success or failure of an implementation (Chiu & Fogel, 2014). Project managers often possess high emotional intelligence levels, and, as they identify leaders with these talents, they should strive to engage these individuals as partners in the effort to increase overall levels of leadership support.

Mitigating gaps. Six Sigma project managers should evaluate how well the leaders will be able to lead the change that will be introduced by the system and manage the employees' doubts and fears. If they do not have a strong network of emotionally intelligent leaders, they should determine ways to mitigate the risk of system failure. They could attempt to augment the gaps by encouraging the involvement of other employees who are supportive of the system, engaging them as leaders of the system. Conversely, they may decide there is opportunity to educate the leaders and include training courses on the topics necessary to close gaps. The project managers leading these types of implementations may determine the risks introduced by not having strong, emotionally intelligent leaders should be escalated to the project sponsors for help.

Strategic links. Project managers must ensure the projects pursued have links to the strategy for a Six Sigma implementation to be effective (Jesus, Antony, Lepikson, Cavalcante, & Teixeira, 2015) and for business leaders to see the benefit of the system. The business case must be identified, with an explanation of how a Six Sigma program will fit within the organizational strategy, how the implementation will impact the organization, how much the deployment will cost, and what the return to the business will be (Little, 2011). Once these determinations are made, business leaders must determine if the implementation should be pursued. If so, project managers should communicate to the leaders how the effort will help achieve strategic objects.

Taner (2013) explained critical successful factors for implementation include vision and planning, links of quality initiatives to business, project selection, and strategic vision. Moran and Youngdahl (2008) explained projects must have links to the overall business strategy to be successful in driving the business toward its goals and objectives. Ultimately, strategic links to the business goals are necessary for projects to lead to business success (Moran & Youngdahl, 2008). Project managers should verify this activity is being led by leaders. If it is not, project managers must determine what action to take to engage leaders in the effort.

Six Sigma project managers aid in project selection. They can influence which projects are chosen by which project managers. In the project selection process, they can encourage certification candidates to choose projects that will be impactful to the business' strategic objectives. If they do not have a formal project selection process, it would be worthwhile to implement one so that they can guide the decisions of which projects to pursue. Also, it is beneficial to the organization for the projects being pursued to be tracked and considered by the same party. This can help to ensure that projects that may adversely affect one another will not be pursued and that redundant efforts will not be undertaken.

Gošnik and Hohnjec (2009) contended project selection is an important component to Six Sigma success. The first step of establishing a Six Sigma project is to create a cross-functional team (Gošnik & Hohnjec, 2009). As part of that team, project sponsors must ensure the objectives are linked to corporate strategies (Gošnik & Hohnjec, 2009). The responsibility of a steering committee is to identify, prioritize, monitor, and evaluate projects. Leaders must ensure Six Sigma projects are linked to corporate strategy (Gošnik & Hohnjec, 2009).

In additional to aiding in project selection, leaders support the Six Sigma project management by removing the obstacles and barriers to ensure data collection efforts, team member focus, and solution implementation are completed timely (Gošnik & Hohnjec, 2009).

Leaders should also either participate on the project steering committee or remain engaged with the team to ensure the projects best suited for enhancing the business are pursued as top priorities and remove barriers to successful project completion. Involvement of the business leaders in these areas is important to get the most value out of a Six Sigma program, because project managers and leaders should work collaboratively to ensure the barriers to the most important work are addressed first by Six Sigma projects. Goldratt and Cox (2004) explained that the theory of constraints provides that resources should first be focused on addressing constraints limiting critical business needs. Project managers own engaging leaders in these activities.

Organizational structure. Project managers should be aware that the structure of an organization can be a factor that will impact system implementation success. Baía (2015) explained that Six Sigma has been criticized because some believe it requires a large investment to be successful and only large organizations can afford the investment. Baía (2015) contended smaller or mid-sized companies may have the advantage of having fewer complications in building teams and training employees. Baía (2015) explained the key to successful implementation is using the system to improve organizational design, restructure processes, reduce waste, and focus on the customer. Whether a company is large or small, project managers can use the advantages of the structure to provide avenues for successful Six Sigma implementation. The project managers need to understand what the organizational strengths of their corporation are and capitalize on them. They also need to consider the challenges that might be created because of the organizational structure, and seek ways to mitigate those barriers. Educating business leaders of the impact of the organizational structure may help them discover ways to capitalize on the strengths of the organization to ensure successful implementation.

Continuous improvement. The existing problem-solving knowledge and methods can be impactful to the system implementation. Gutierrez et al. (2016) explained a well-constructed continuous improvement structure is necessary to an effective process implementation. Employees who understand the basics of continuous improvement are able to understand that incremental improvements are beneficial to business success. Employees who do not have experience driving improvement may feel that only large-level initiatives are worthwhile. Project managers must consider this in their training plans, and ensure business leaders will support the additional training time necessary if employees do not have an understanding of continuous improvement.

Organizational maturity. Project managers need leaders to prepare the culture and employees for the change that will be introduced by the system implementation (Kotter, 2017). Duarte, Montgomery, Fowler, and Konopka (2012) provided that Six Sigma practitioners should be informed of which areas in the company are most likely to be prepared for Six Sigma deployment. Project selection strategies are impactful to the success and sustainability of Six Sigma programs and business characteristics within sections of the business should be evaluated for readiness for project executions (Duarte et al., 2012). These characteristics include process structure, frequency of execution, existence of metric measurement, level of automation, strategic impact, geographical dispersion, and process cost (Duarte et al., 2012). Project managers and leaders should have a method to determine when a business area is well-prepared for Six Sigma deployment (Duarte et al., 2012). An evaluation of the area in which Six Sigma practitioners plan to implement the system is a prudent first-step in preparing for system deployment (Duarte et al., 2012), and project managers may need outside counsel from consultants to make this determination. They will need the business leaders to support the cost of hiring contractors for this purpose.

Two factors should be discussed with the leaders prior to enlisting consultants to conduct an assessment so they are not surprised by the process or caught off guard by what may be discussed. These factors are how well the leaders have done to prepare their areas and how committed the leaders are for the effort. Contractors may assess how well leaders have prepared the areas for initiatives geared toward improvement (Duarte et al., 2012). The assessment process could indicate how committed leaders are for this type of effort and help project managers identify issues that could deter project success.

Training. Training is important to the success of a system implementation because the employees need to understand why the system is necessary and how it impacts them (Marzagão et al., 2014). They also need to understand what their role is in the system and how to use the tools (Kumar et al., 2011; Enoch, 2013; Moosa & Sajid, 2010; Suresh et al., 2012). Project managers must determine the skills necessary for the team driving the implementation effort, and create a development plan for those who are lacking (Little, 2011). Project managers deploying a system should include a training plan in their project implementation plan (Little, 2011). Within this plan, the resources necessary to execute the training should be considered. The training component of the implementation effort is critical to project success, and project managers must have a method for achieving the support of leaders to use resources in this way (Lee & Choi, 2006). Leaders must ensure all levels of employees needing training have opportunity to attend training, even if resources must be obtained to fill their roles while they attend training.

Project managers should advise leaders that the training required may be extensive and time consuming. Douglas, Douglas, and Ochieng (2015) and Taner (2013) explained that the training aspect of the implementation is imperative and it must include training on all the Lean and Six Sigma tools. For Six Sigma to be effective, the employees must be trained on project

management, including project communication, scope, planning, and team facilitation (Pinedo-Cuenca, Gonzalez Olalla, & Setijono, 2012). Project managers should consider the time required to train employees on the appropriate levels of information for each of these topics. Project managers need a plan for presenting this need to leaders and gaining their approval.

Complexities of Six Sigma deployments. Project managers have a challenge of obtaining leadership support despite the fact that Six Sigma deployments are complicated. Six Sigma implementation efforts and training include many components, and project managers need to understand how to acquire the leadership support necessary for each element to be successful. Antony and Karaminas (2016) explained that Six Sigma practitioners are responsible for change management and championing the use of statistical tools. To help ensure statistical tools will be used, Six Sigma training includes information on statistical tools and soft skills required to conduct a successful project (Antony & Karaminas, 2016). The success of the system requires that Six Sigma practitioners have the ability, not only use and teach the statistical tools, but also to obtain the necessary leadership support to implement and sustain the system (Antony & Karaminas, 2016). The project manager leading the system implementation can evaluate where the organization stands on these items, but he or she must evaluate what actions should be taken to achieve success. The business leaders will have to sign off on the time and resources required to accomplish what the project manager prescribes (Arcidiacono et al., 2016). If they do not, there is no framework available to support the project manager in gaining approval and support.

Training within the project team. Project managers need to ensure project champions and sponsors know how to support a project. Project sponsors and champions should be trained on their roles in ensuring project teams can focus on projects as priorities (Arcidiacono et al., 2016). Their roles are critical to project success. Van den Bos, Kemper, and de Waal (2014) declared that risks to Six Sigma system and project success include project teams not being able

to focus on projects as a priority, insufficient planning, and inadequate communication. Each of these elements is part of project management and championship. Six Sigma success and sustainment can be aided by project management tools and methods, including a structure that requires a project champion (van den Bos et al., 2014; Arcidiacono et al., 2016; Douglas et al., 2015; Pinedo-Cuenca et al., 2012). Project managers should offer training to those championing project efforts to ensure they know their role and the importance of their support.

Classroom and on-the-job training. Haque (2008) explained that the training design is important to employee learning. Six Sigma practitioners have to consider this when determining how to structure training programs. The design and timing of the training are important to system success. Gutierrez et al. (2016) provided that adequate training at the time of system implementation will provide heightened performance later.

The Six Sigma professionals who structure the method and strategy for rolling out the system must consider which employees to train and at what level. They also have to consider how to train them. For example, they should think about how some employees will grow from having time away from day-to-day tasks to focus on classroom instruction when they are being introduced to the program. After learning the basics, their education may be amplified if they have the opportunity to learn by doing and have instruction in their normal day-to-day environment. Project managers should obtain leadership approval of the training plan as well, since the types of training plans that will be effective may be time consuming and costly.

Mentoring programs. Successful implementation of any initiative requires strong leadership, proper planning, and effective communication (Emblemsvag, 2014). In addition, a mentor program can be beneficial in preparing leaders and employees for change and educating them about the changes (Arts, Furimsky, & Lampson, 2013; Gijo & Rao, 2005). Project managers must ensure leaders will support a mentor program as a means for training.

Training and mentoring is key for adapting a culture to be in a position to accept a new system that may not mesh with the way the employees feel things should be done (Canato et al., 2013). Trainers and mentors have an opportunity to provide the employees examples of how Six Sigma tools can help them. They can lead the employees through improvement endeavors as part of the training or mentoring to demonstrate how easily the tools can be used to generate cost-saving results.

Executive coaching. Leaders who are not capable of leading or engaging in the appropriate manners may prosper from executive coaches (Grant, 2014). Project managers seeking to implement a large-scale system, such as Six Sigma, may find advantages in employing coaches to help develop leaders. Coaches have the ability to provide leaders support in implementing change, educating employees and leaders on the value of the program being implemented, and ensuring the tools within the program are used properly to enhance profitability (Grant, 2014). These coaches can help enhance the leadership skills managers have and give them a foundation for leading change (Boyatzis, Smith, Van Oosten, & Woolford, 2013). Heightened emotional intelligence strengthens leadership effectiveness, and coaches can mature leaders in this regard (Batool, 2013; Boyatzis et al., 2013; Kerr et al., 2006; Canato et al., 2013). Leaders who have the ability to lead change have the necessary skillset to lead an efficient system deployment (Canato et al., 2013; Kotter, 2017). The more streamlined leaders can make the implementation, the less costly the effort will be to the company and the more likely there will be a return on the resources invested in the implementation. Coaches who can be effective in advancing the skills of leaders would assist the project managers striving to complete an implementation effort.

Project management skills. Thomas et al. (2014) explained that it is important for those who will be leading Six Sigma projects to receive project management training. Six Sigma

projects should be completed timely and within budget, just as other types of projects. The skills needed to successfully manage a project are necessary for working through the DMAIC process with a team and completing a Six Sigma project (van den Bos et al., 2014; Arcidiacono et al., 2016; Douglas et al., 2015; Pinedo-Cuenca et al., 2012; Eckes, 2003). The better prepared the employees leading Six Sigma projects are to lead teams, handle conflicts, influence others, manage budgets, and execute implementation plans timely, the more likely they are to succeed in their efforts to achieve the objectives of the projects (Moran & Youngdahl, 2008).

Müller and Turner (2010) found successful project managers were skilled at critical thinking and influencing others. They have a propensity for motivating teams and are conscientiousness (Müller & Turner, 2010). They are capable in empowering others and involving employees (Müller & Turner, 2010). Leadership competencies should be considered when assigning project managers to projects and structuring training for project managers (Müller & Turner, 2010). Project manager training should include focus on managerial skills as well as leadership tactics (Müller & Turner, 2010). As these types of behaviors are beneficial to system deployment and sustainment, training included in the Six Sigma system implementation should include modules focused on developing these behaviors in the individuals who will lead Six Sigma projects. Educating project managers on what these skills are and how they are manifested will prove valuable in helping them ensure leaders are capable of supporting implementations.

Communication. Leaders who are skilled at communication tend to have success implementing Six Sigma systems (Kavčič & Gosnik, 2016). Communication is necessary to help the employees understand why the system is important and guide project managers to select projects most beneficial to the organizational strategies (Taner, 2013; Somasundaram & Badiru, 1992). Communication also helps to ensure all stakeholders understand the status of system

implementation and how successful the endeavor is. Proper communication will help garner support for the system and the projects being conducted. Project managers driving a system implementation should construct a communication plan (Little, 2011) and delegate communication tasks to business leaders as necessary.

Chakraborty and Leyer (2013) claimed that a good communication flow is important for Six Sigma implementations. The information loops should include the operational-level employees (Chakraborty & Leyer, 2013). Every employee should be informed about the deployment initiative and why it is beneficial (Chakraborty & Leyer, 2013). The project manager should include these elements in the project communication plan and ensure leaders cascade the information to all employees. Chakraborty and Leyer (2013) found though the critical success factors to Six Sigma deployment are well defined, a gap in literature is there is no explanation of how organizations manage these factors. This parallels the theory that Six Sigma practitioners understand leadership support is necessary for successful system implementations, but they are not provided a framework on how to garner this support.

The impact of a communication plan can be critical to a successful implementation (Fojt, 1995). A solid communication plan must be established and executed to prepare employees for implementation. The structure of the communication plan must be in place prior to the launch of the initiative (Ramsing, 2009). The audience must be well defined and the content needs to be appropriate to convey the message without overwhelming the audience (Smith & Torppa, 2011). The method of delivery must be appropriate to reach the intended audience (Ramsing, 2009). The more information the leaders can share about the value of incorporating the programs, the more engagement they can expect from the employees. Six Sigma practitioners can aid leaders in developing a communication plan for the implementation of a Six Sigma program, but, unless

they have direct authority over the leaders, they cannot necessarily impact the leaders' diligence for executing the communication plan.

Transition and Summary

Introducing Six Sigma to an organization is a complex initiative that requires diligence to project management methods, leadership support, and change management. Multiple factors must be considered when determining how to implement the system successfully and in a way the system will be sustained. Business leaders must be prepared and willing to ensure the critical success factors to an implementation are considered and in place as the system is introduced to employees. Six Sigma project managers own project success and must find effective ways to garner leadership support to ensure the critical success factors are put in place. Leaders would benefit from understanding what type of value the system will provide the business and be able to communicate the anticipated return on investment the business will reap. Business leaders must take the lead in establishing environments conducive to executing successful projects that use statistical means to drive improvements. They must also help employees understand how the system will function and what value the system will provide them.

Business leaders will want to avoid unnecessary expenses associated with an ineffective implementation. Literature explained that a successful implementation of any initiative requires strong leadership, proper planning, and effective communication (Emblemsvåg, 2014). Also, in an implementation, a mentor program helps stakeholders, leaders, and program participants navigate through change and understand how the initiative involves them and will impact them (Arts et al., 2013). A mentor program could enable an organization's leaders to implement a Six Sigma successfully, through improving both change management and communication skills. Through the benefits of a mentor program, leaders will be supported in areas where their skills

may be lacking and employees will be able to understand and accept the changes and engage in the new system. Mentor programs can help reduce the risk of system failure.

The literature cited helps readers understand important elements of implementing new initiatives. The existing literature does well to cover aspects of change management and important elements of implementing a new initiative, such as good communication strategies, strong leadership, and cultural components. The weakness of the current available literature is a lack of discussion on possible advantages of phased implementations and strategies for overcoming instances where leaders are not as supportive in the system as would be desired. Topics that may be missing are as follows: the effects of leaders who do not understand the system well and inadequate explanations of the return on investment provided by the Six Sigma systems. A framework for Six Sigma practitioners seeking to implement a successful and sustaining Six Sigma system without high levels of leadership support is not provided or discussed in literature.

Section 2: The Project

This study explored how project managers can acquire the support of leadership for implementation initiatives. To understand this research question, project managers and leaders of a global corporation were interviewed, interactions between project managers and leaders were observed, and documents related to the Six Sigma system were reviewed. A qualitative study following a case study approach was used to address the research question. This section explains the research project particulars, including the overall purpose to be achieved and the role of the researcher and participants. The research method, design, population and sampling, and data collection plan details are included in this section. The data analysis technique and study reliability and validity considerations are provided as well.

Purpose Statement

The purpose of this qualitative case study was to understand how project managers that implement Six Sigma systems can achieve the needed support from leaders in manufacturing organizations at the production facility level. At this stage in the research, the support project managers need to garner from leaders will generally be defined as participation within the project management system as project sponsors and champions and insisting that Six Sigma project management methods and statistical tools be used to reduce errors and inefficiencies. This study was designed to provide guidance for practitioners to follow to obtain leadership support for implementing and sustaining Six Sigma programs. The important elements for obtaining leadership support will be described. The case study will provide information on the suggested tactics for successfully attaining necessary levels of leadership support, according to Six Sigma practitioners, mid-level managers, and employees in the manufacturing environment.

Role of the Researcher

The researcher of a qualitative study serves the role of the data collection instrument (Stake, 2010; Creswell & Poth, 2017). The researcher conducted the interviews described as part of this study and observed project managers and their interactions with leadership. The researcher gathered the results of the interviews and observation notes and compiled them in a meaningful, descriptive manner. The researcher observed portions of the Six Sigma operations of the company, including recording the number of projects currently in process, the number of projects on schedule and behind schedule, and the number of cancelled projects. The documents associated with the Six Sigma program were reviewed by the researcher to provide insights into the status and effectiveness of the system to seek connections between what interviewees provided and the current state of the implementation.

Participants

The researcher is currently employed with the organization in which the study took place. Those in the direct reporting structure and in the legal department have approved the study and the research plans. Interviews were scheduled with both the project managers who have implemented Six Sigma systems and leaders who are responsible for the areas where Six Sigma is used. The project managers hold Master Black Belt certifications and are experts in Six Sigma. Merriam (2009) explained that participants of a qualitative research study should be knowledgeable about the question being researched, willing to explain their views, and take part in the exploration process. Thus, these participants were chosen because of their knowledge with the subject matter explored to answer the research question. The researcher verbally explained to the interviewees the purpose of the interviews and how the information obtained will be used prior to the interviews being conducted. Prior to the study, the researcher verbally advised each participant of the study background and requirements and asked if each was willing to participate

in the study. The researcher provided each participant the written transcript of the interviews, and each was asked to approve the content of the transcript prior to the interviews. If any corrections were requested, the researcher ensured modifications were made promptly and provided to the participants. All of the data obtained through the interviews and observations were made available to the legal department of the organization prior to being published through the dissertation process. Confidentiality of the organization, participants, and information provided by the participants was protected throughout the research process. The information was housed on a company computer, which is protected by two passwords. The researcher has sole access to the computer and the files stored on the computer related to the researcher. No hard copies of the research information exist except the final report. All documents and records obtained and created through the research process, except the final report, will be maintained for three years on the OneNote file and then deleted.

The following sections discuss the research method and design, data collection and technique, and information on the participants of the study and interview questions. The structure of the study designed allowed information on how project managers garner leadership support for system implementation to be presented and explained. The detail provided is explained at a level that the research can be duplicated in comparable environments.

Research Method and Design

Since the purpose of this qualitative study was to understand how project managers that implement Six Sigma systems can achieve the needed support from leaders at the manufacturing locations, the researcher needed to select a study method best suited to understand a specific circumstance. Since a combination of interviews and observations were needed to address the research question, a case study was the most appropriate study design (Yin, 2009). The method of research is critically important to a successful outcome of understanding the research problem

(Creswell, 2009). The research method chosen and the design of the research is explained in the following section.

Method. Since this study was focused on a question that asks how something occurs, a qualitative method was most appropriate for this study (Stake, 2010). Stake (2010) guided researchers who wanted to discover meanings and study real-world settings in a natural environment to use the frameworks provided by a qualitative study. Statistical measures and analysis, which are included in quantitative studies (Creswell & Poth, 2017), were not included in this study plan, because observations, interviews using open-ended questions, and surveys provided the information needed to understand how to gain adequate levels of leadership support for a system implementation. These are tools used in qualitative studies (Stake, 2010). Because statistical tools are not necessary to the structure of this study on how leadership commitment can be attained for Six Sigma deployment, a mixed method would not be practical for this study, as a mixed method includes quantitative evaluations.

Research Design. The successes and learnings of the Six Sigma implementation in the organization studied and the methods used by project managers within the business were considered in this study. The documents and materials pertaining to the Six Sigma program were reviewed and leaders involved in the system were interviewed. The structure of the study followed a case study design, which includes the questions of the study, the proposition of the research, the units of analysis, logical structures that link the data to the proposition, and criteria for interpreting the findings (Yin, 2009). The research question and the proposition are explained in the following paragraphs. The units of analysis, or population and sampling, logic linking the data to the propositions, and the criteria for interpreting the findings is explained in the latter portions of Section 2.

Leaders within three manufacturing facilities within the organization were interviewed to understand their current knowledge of Six Sigma and comfort with the system. Since the system has only been in place for a short time, an ethnographic study design, which considers shared beliefs developed over time (Creswell, 2009), was not chosen. The researcher sought to understand the factual relationship of the methods employed by project managers to successfully implement a system and the resulting levels of leadership support.

In this qualitative case study, data were gathered from six Six Sigma project managers, six leaders, and employees through direct observations and interviews. The Six Sigma project managers included in the study are currently employed with a large, global manufacturing company and were interviewed about the challenges they face with deploying the Six Sigma system and elements of success they have found in enlisting support from leaders based in manufacturing facilities. Employees of the same organization were observed to uncover how likely they are to use Six Sigma tools and methods when charged with fixing a problem. The observations informed the study of how the responses leaders gave to questions related to the levels of support they provide for the system are linked to employee engagement in the system. Leaders of the organization were interviewed so that the researcher could understand their perspectives on the Six Sigma system. These interviews and observations were designed to provide information on how leaders can be influenced to provide support for Six Sigma implementations, and the study should assist project managers with understanding if the elements of leadership support suspected to provide elevated employee engagement in the system proves effective. Through this study, a framework for enlisting leadership support has begun to take shape.

An interview process was chosen for the six Six Sigma project managers because interviewees may provide feedback in a way that can be understood more completely than

through a typical survey. Creswell (2009) explained that qualitative procedures are included in a narrative analysis and this type of study provides information about the lives and experiences of individuals. This study goes beyond the descriptions of personal accounts, so a narrative study was deemed too narrow of a study design to conclude how project managers can garner leadership support. The researcher considered the constructs of a narrative analysis and the interview questions were drafted in a way the researcher could gain insight into the interviewees' experiences, but supporting documents and behavioral observations were needed to formulate a comprehensive understanding of how project managers can find success obtaining leadership support. For this reason, the narrative study design was too restrictive to allow the researcher insights into behaviors and structures within the system. Through the case study design, the project managers had an opportunity to share what they experienced and perceived to be strengths of the training, the leaders had an opportunity to explain their knowledge and perceptions of the system, the researcher was able to explore the requirements of the certification process and the documented elements of the program, and the support structure within the system was unveiled.

Grounded theory designs are used to provide an explanation for a process or action that is rooted in the beliefs of the study participants (Creswell, 2009). Though one could relate the purpose of this study, which is to determine how a project manager can gain leadership support for a system implementation, to the development of a theory, the true intent of the researcher was not to create a theory, but, rather, to begin to structure a framework that would guide project managers in garnering leadership support in the practical application of the methods. For this reason, the grounded theory design was not the best fit for this study.

The first portion of the study design presented the research question, what are the evidenced-based best practices utilized to obtain leadership support for Six Sigma projects? This

question served as the foundation for the structure of the research design and gave focus for the review of literature. The research question was established based on the findings that more than 70% of Six Sigma systems fail, and the most critical component to system implementation success is leadership support (Albliwi et al., 2014; Sharma & Sharma, 2014). Sharma and Sharma (2014) explained that the inadequate leadership support contributes to system implementation failure. Based on this information, the research question had to remain focused on understanding what methods are effective for project managers to obtain leadership support for implementation efforts.

The second element of the research design was based on the proposition that project managers are held accountable for the successful execution of the projects they are assigned but they do not have positional authority to require leaders to support their efforts (Bowenkamp & Kleiner, 1987). This adds complexity to the direct correlation of project success and leadership support. Project managers may not be afforded methods for achieving adequate levels of leadership backing. This research was designed to uncover successful methods in obtaining the critically needed support.

Population and Sampling

Two levels of sampling are required for qualitative studies (Merriam, 2009). The case to be studied must first be selected and, after the case is determined, the participants to be included in the study must be defined (Merriam, 2009). Three locations under one corporation were chosen for the case study, which meets the required minimum of one cases for a valid qualitative case study as described by Creswell (2009) and Yin (2009). Six leaders and six project managers employed with the organization participated in the study. Enough interviewees were included to ensure saturation and they provided relevant information with certain elements of replication. The interviews between the project manager and the leader groups provided

common themes and trends and there was high agreement between the responses within the two groups. Yin (2009) suggested the replication among participants strengthens the applicability of the study. The study participants were selected because of their knowledge and experience with the Six Sigma system.

Employees of two of the North American manufacturing facilities were observed over the course of one month as they pursued solving problems. Project managers were selected to be part of the study because of their assigned task of implementing Six Sigma in the organization. In any Six Sigma program, Master Black Belts serve a significant role in ensuring a successful system (Jesus et al., 2015). Leaders responsible for leading teams at the manufacturing-facility level for three of the manufacturing sites were chosen to be interviewed as part of this study because of their role in the Six Sigma system at the plan level. All leaders chosen for the study have been introduced to the construct of the Six Sigma system and have been trained on the requirements of them to serve as champions of Six Sigma projects. The selection of these individuals as study participants was influenced by Yin's (2009) guidance that the individuals included in scholarly studies should be knowledgeable on the research topic.

Data Collection

This study capitalizes on the constructs for qualitative studies as described by Creswell (2009) and case study methods as explained by Yin (2009). The case study was investigated over time through detailed data collection from various sources, which adheres to Creswell's (2009) guidance. Multiple sources of evidence included documentation reviews, interviews, direct observations, and analysis of data pertaining to the status of the Six Sigma implementation. The inclusion of this many forms of information follows Yin's (2009) proposal for using multiple means of obtaining data and strengthens the accuracy of the study findings.

Instruments. The researcher in qualitative studies is considered the instrument for data collection (Creswell, 2009). One researcher was used in this study. The researcher conducted interviews, compiled data, analyzed data, observed employees in problem solving efforts, and formulated the results of the study. The researcher took care to include interviews from leaders and project managers at multiple manufacturing facilities within the organization. The inclusion of these individuals allowed multiple viewpoints to be considered.

Data Collection Technique. Interviews were conducted of six project managers and six leaders to gather information on what tactics have been used to gain leadership support and what levels of support have been achieved using these methods. The interview process allowed the study participants to express their experience and provide guidance on what can be done to obtain leadership support. The interview responses were paired with data collected through observations to identify themes within the study.

Research Interview Questions – Project Managers

Six Sigma project managers who are working to deploy the Six Sigma system were interviewed to understand what challenges they face in the absence of leadership support and ways they have been successful obtaining leadership support. The researcher sought information to understand if there is a problem with leadership support, from the practitioners' perspective, and how practitioners have found success in obtaining needed support. The researcher asked about the project managers' experience in system implementation to gain an understanding of their perspective. The project managers were asked what type of support leaders have provided for the system, what the practitioners have done specifically to raise leadership support, and what challenges they have faced. The project managers were also asked what suggestions they have for improving the likelihood of success for the system in light of leadership support. The specific interview questions can be found in Appendix A.

Research Interview Questions - Leaders

Leaders of the same organization who serve in manufacturing facilities were interviewed in an effort to understand their willingness and commitment to advocate the use of Six Sigma tools and methods. This informed the research in understanding the willingness of leaders to participate and support a Six Sigma implementation. The interview questions helped the researcher uncover how knowledgeable leaders are of Six Sigma and how likely they are to engage in activity that demonstrates support of the system. The questions can be found in Appendix B.

Data Organization Techniques. The interviews in this study were recorded. The researcher transcribed the interviews exactly as they were recorded. Themes within the responses were identified through coding, which Creswell (2009) explained is beneficial for condensing the data into categories for ease of interpretation. The coded responses were tallied to demonstrate where there were replications in the responses. The case study observation notes were categorized by theme. All of the records pertaining to the case study were organized in OneNote for ease of access and maintenance. This software allows the researcher to add tabs and upload voice recordings and any type of document or picture to the organized sections of OneNote. These sections were organized according to Yin's (2009) techniques by having tabs named Case Study Notes, Case Study Documents, Tabular Materials, and Narratives. The software and documents were kept secure with the requirement of two password entries to access the database. The information was backed up on an equally secure file. No hard copies were created.

Data Analysis Technique

The premise for this study was based on the high volume of failures of Six Sigma implementations and the explanations provided in literature that leadership support is a highly

correlated and critical component of implementation success. The interviews were recorded and then transcribed word-for-word in Microsoft Word. Each interviewee was provided a copy of transcript to approve. The researcher waited for approval prior to coding and categorizing the data. The data obtained through the interview process were coded through color highlights in Word and categorized by major theme using Excel. The replications were noted by tallying the number of times themes were identified and in which transcript they were found. This technique helps to highlight themes that are relevant to the study and to reduce the number of categories by linking similar properties (Merriam, 2009). The categories determined by the researcher allowed the interviews to be compared to one another and replications to be discovered. The names of the interviewees were removed and an alpha character was assigned to each interviewee. All files were stored in an organized fashion in OneNote in the appropriate tabs for ease of access.

The coding used in organizing data obtained through interviews included numeric identifiers throughout the transcripts for similar themes. These themes were categorized by descriptive names. Each phrase identified by a particular number was copied and pasted into Excel under the appropriate category. Each transcript was highlighted with a particular color so that the summarized quotes retained identifiers to show from which transcript each quote was obtained. This helped demonstrate where there were replications across participants. The number of times a particular theme was mentioned was tallied in Excel to provide a quick visual representation of the most frequently mentioned topics.

The information obtained through observations and reviews of documentation were categorized in OneNote. A process similar to the organization methods for the data acquired through interviews was used to demonstrate replication of themes and sentiments. The notes were coded through a color coding method where themes were highlighted with colors that corresponded to specific categories. A table was created in Excel with the same categories that

were identified from the interviews. The direct quotes from the interviews, observations, and document review were copied into the Excel file in the proper category column. A numerical summary of the number of times the idea or theme appeared in the interview data, documentation information, and observation results was created by tallying the number of occurrences within the Excel table.

Reliability and Validity

Ensuring reliability and validity was imperative so that the results of this study can be used by project managers to successfully garner leadership support for system implementations. Key considerations to safeguard the reliability and validity of a qualitative study are to account for personal bias and strive to mitigate the effects of the bias on the study, maintain detailed records, show transparency in the documentation of the study design and techniques, afford interviewees an opportunity to review typed transcripts before analyzing the data, and incorporate triangulation when possible (Creswell, 2009). Defining the domain in which the study's results can be applied successfully and ensuring enough detail is included in the report for ease of replication of the study increases the validity and reliability of the study (Yin, 2009).

Reliability. The reliability of this study was protected by defining the criteria for study participants and the type of experience the participants have. The meticulous explanations of the data collection and organization methods provide the detail necessary for replication of the study. The researcher bias, which was caused by experience with Six Sigma system implementations, was controlled by recording interviews and transcribing exactly what was stated. The information was reviewed and approved by the interviewees prior to being categorized and analyzed. Each interviewee was asked the same open-ended questions, read verbatim, and the same systematic approach was used for categorization and data organization. The data collected

were not shared with any of the study participants and all information pertaining to the study was housed in a password-protected computer.

Validity. The validity of this study was critical to the purpose of conducting the research because how closely the reality of the case study can be applied to the general population determined how effective the study was at explaining how project managers can obtain leadership support for system implementations. The researcher needed to protect the validity to ensure the data captured were a direct reflection of reality, which is internal validity (Creswell, 2009; Yin, 2009). Internal validity was protected through the researcher's focus on recording exactly what participants said and maintaining detailed records throughout the study. Should this study be duplicated, the external validity would be increased since the study included only the employees of one organization. By conducting the study again at a different organization, if similar themes were found, the findings would be shown to be relevant and accurate. Both internal and external validity was protected through the design of this research. The triangulation of using multiple sources of information increased internal validity. Considering the experiences of leaders from three different facilities also enhanced internal validity because the feedback provided could be compared to the other interview responses, highlighting similarities. The overlay of information obtained through interviews, observations, and documentation reviews emphasized redundancies, which helped provide confidence that the results of the study provided a true reflection of reality.

To ensure adequate data saturation for the study to be replicated, the data obtained through the study design should be coded until additional coding was no longer feasible and the ability to obtain new information has been attained (Fusch & Ness, 2015). These requirements have been met through the method of coding chosen for the study and new information on how project managers can garner leadership support have been obtained. Additionally, enough

information to replicate the study has been acquired and provided, as suggested by O'Reilly and Parker (2012) and Walker (2012). The sample size chosen for this study allowed these objectives to be met.

Transition and Summary

This study explored methods project managers can use to obtain leadership support for implementation efforts. To investigate the research question, Master Black Belts, which are project managers charged with system implementation, and leaders of an organization where Six Sigma has been implemented were interviewed. Observations were made of employees working within the system. A qualitative case study was used to answer the research question. This section described the research project process by explaining the methods and techniques used for obtaining, analyzing, and interpreting the data. The data analysis techniques were described in a manner that another researcher could duplicate the study. The findings from the data were organized and presented in a report that is discussed in the following section.

Section 3: Application to Professional Practice and Implications for Change

This section provides the conclusion to the overall qualitative study by presenting the findings, applications of the study results, and recommendations for action. A comprehensive literature review was conducted at the beginning of this study to understand what explorations have been pursued into the topic of Six Sigma implementations. The researcher was specifically interested in the factors discovered as the most impactful to how project managers can obtain leadership support to ensure a successful and sustained implementation. Though the important factors to a successful Six Sigma deployment have been identified and discussed in previous studies, a gap persisted where studies and research have not explained how project managers charged with introducing the system to an organization can effectively gain the support of leaders. This gap is significant because leadership support is consistently named as a critical success factor to system deployment.

The study included interviews of project managers who have been charged with implementing Six Sigma in different regions of the same corporation and leaders based in manufacturing sites in those regions. Observations of employees and leaders working within the Six Sigma system and project managers leading training were conducted. The researcher reviewed archival data about the status of the Six Sigma system. All of this information has been compiled and considered in juxtaposition with the information provided by literature. The results of the study are explained in the following section followed by recommendations for actions and future topics of research.

Overview of Study

This qualitative case study was pursued to understand how project managers can effectively garner support from leaders when striving to implement a Six Sigma system. Approximately 70% of the companies that have attempted to integrate Six Sigma into their

organizations have failed (Albliwi et al., 2014). These thwarted attempts are significant because of the time and cost required to implement the system. The failures could be caused by inadequate leadership support (Sharma & Sharma, 2014). The literature explained that leadership support is imperative for project success, but no guidance is provided on how project managers can obtain leadership support. Project managers are not typically in a position of authority over leaders and cannot require engagement and support of the leaders. This challenge can pose a threat to a successful system implementation because leadership support is imperative for achieving the objectives of projects. Understanding methods that have been proven successful for gaining leadership support will provide value to project managers seeking to implement systems. The feedback provided from project managers and mid-level leaders delivered guidance for project managers on how to be successful in achieving support from leaders. These approaches include proving the successes of projects, demonstrating relevant examples of successful projects, communicating project status concisely with leaders in relatable terms, and explaining to the leaders what support is needed. In the following section, the findings are discussed in detail.

The first step in conducting this study was a comprehensive review of applicable professional and scholarly literature to understand what previous studies had determined as critical success factors to accomplishing a Six Sigma implementation. The researcher also sought information on how project managers are instructed to engage leaders in the implementation and support the deployment. The literature did not provide suggestions for how project managers can garner leadership support or overcome instances where there is inadequate support from leaders.

The literature provided an understanding of the factors that impact the level of support leaders provide and explained the responsibility project managers have for project success. From

these considerations, the researcher developed a conceptual framework that provided a foundation for the study. The components of the conceptual framework are that leaders must manage change (Kotter, 2017), project managers own project success (Bowenkamp & Kleiner, 1987), leaders must support projects for the project objectives to be met (Gattiker et al., 2014), and leaders are subject to the limitations explained by the theory of constraints (Goldratt & Cox, 2004). Because the purpose of this study was to understand how project managers can obtain leadership support, the theory of constraints was selected to ground the associated research. The literature review helped explain the critical success factors for implementation accomplishment and interviews of project managers and leaders provided overlapping suggestions for how project managers can achieve adequate levels of leader support while being sensitive to the many priorities leaders must manage.

To provide complementary information to expand on the gap in the literature review that did not explain how project managers can obtain support from leaders, interviews of project managers who had been charged with implementing Six Sigma in various regions within one company and leaders who serve at manufacturing sites in those regions were conducted. The sentiments expressed through those interviews were considered between project manager responses, amongst leader responses, and between project manager and leader responses. The researcher examined areas where there was high agreement between each group and between the two groups. The researcher also made note of outliers. All of the information derived through the interview process was compared to archival data available about the system implementation and observations made by the researcher. The qualitative case study included the interpretation of interview responses, observations, and documentation reviews. The resulting triangulation enhanced the reliability and validity of the study.

The findings of the study addressed the following research question: How can project managers gain adequate levels of support from leadership to successfully deploy and sustain a Six Sigma program? The findings resulted from open-ended interview questions, document reviews, and observations. Observations were conducted during the course of seven weeks and included watching Six Sigma Green Belt training, employees working to solve problems as teams using problem solving cards and kaizen workshops, individuals working to complete Green Belt projects, teams conducting root cause analysis activities, project managers leading project after-action-review meetings, and team members working through in-the moment trouble shooting. During these observations, the researcher had an opportunity to witness project managers interacting with leaders, employees using the Six Sigma system, leaders engaging in Six Sigma efforts, leaders championing Lean initiatives, and employees striving to solve problems. The researcher noted that employees used Six Sigma methods as prescribed through the Lean system in place at the organization and leaders were present during reoccurring meetings to hear about project updates, barriers, and risks. Leaders asked questions during the project report outs and demonstrated interest in the progress of the projects. Project managers used the standard templates available for the project report outs. The documents reviewed by the researcher showed the number of employees trained in Six Sigma by region and the number of certification projects closed or aborted.

The data collected were compiled into categories and coded so commonalities and disconnects between interview responses, observations, and documentation reviews were clearly evident. Axial coding was used to compare new data to previously coded data and narrow the number of categories so they could be related to the research question. Axial coding is useful for finding links between categories and themes to refine the categories used (Merriam, 2009). In summary, the categories defined as effective means for project managers to acquire leader

support for Six Sigma implementation projects were as follows: (a) incorporate Six Sigma into existing programs, (b) communicate, (c) build competencies, (d) ensure projects are linked to key performance indices (KPIs), (e) have and communicate a vision and plan, and (6) ensure top-down support. Most of these categories are similar to categories found in the review of professional and academic literature that were named as critical success factors for system implementations, but the idea of incorporating Six Sigma into existing programs to help project managers gain support from leaders for Six Sigma implementations was unique to this study. The feedback from the interviews suggested that integrating Six Sigma into the company culture and how work is done helps project managers to avoid competing with priorities leaders must manage. This finding helps to close the gap found in literature where no instruction was provided to project managers for how to obtain leadership support.

Several links between the case study and the literature review were noted. For example, project managers and leaders expressed the challenges leaders face due to competing priorities, which is explained in the theory of constraints. Areas where the case study presented ideas not seen in literature were the positive correlation between a knowledgeable and consistent implementation project team and leader support and the adverse effect turnover in key positions has on system implementation success because of the shifts in leader support. Also, the leaders explained that they need project status communications to be brief and they prefer a one-page dashboard be used as a communication tool. There was also feedback from the project managers that suggested there are challenges in defining ownership of the system, or a clear handover at the conclusion of the implementation project. The literature did not highlight this as a concern in regard to implementation success and sustainment. Perhaps the studies that defined leadership support as a critical success factor to system implementations expected that when leaders support implementation projects they will take ownership of systems meant for their use. However, the

transfer of Six Sigma system ownership was not specifically discussed. For ongoing sustainment of the system, this difference is significant due to the impact leaders have on the success of the system when they expect their employees to use Six Sigma for complex problem solving. This expectation benefits the continued longevity of positive returns that can be provided to the corporation through the use of the system.

Presentation of the Findings

This study was designed on the premise that project managers depend on support from leaders for project success. The interview process and observations worked together to answer the research questions. Common themes that described how project managers can obtain support from leaders and convey to leaders the importance of leadership support to successful completion of implementation projects emerged through the interview process. The interview process and the observations conducted by the researcher helped identify relationships and themes that explain how support from leaders can be developed and sustained and what motivates leaders to support Six Sigma implementations. These themes and relationships are discussed in detail in this section.

All of the project managers interviewed acknowledged that support from leaders is critical for Six Sigma implementation projects to be successful and for the system to be sustained. The interview responses from the project managers and leaders suggested that both groups agree that project managers can garner support from leaders for Six Sigma implementations through demonstrating the success of the program and embedding Six Sigma methods into programs, tools, and initiatives the company is already using in day-to-day work (Interviews A, B, C, D, E, F, G, H, & I). Project managers suggested they have found success in obtaining leadership support when leaders have had the opportunity to experience and observe successes found through the application of Six Sigma (Interviews A, C, E, & H). Both project

managers and leaders acknowledged leaders are challenged to support Six Sigma because of competing priorities (Interviews A, B, C, D, F, H, I, & L). This challenge was also explained by the theory of constraints, which was one of the foundational concepts for the study.

The literature review identified critical success factors for system implementations, but no instructions were found that would guide project managers in understanding how to ensure the elements critical for system deployment success are in place. Literature named leadership commitment and support as key critical success factors, but project managers were not instructed on how to obtain leadership support for system deployments. The interview process revealed that both project managers and leaders believe leadership support is important for system implementations, and each group provided ideas for how project managers can obtain this support. The major themes amongst each group's feedback and between the two groups' feedback were that project managers can garner support from leaders through (a) providing timely and thorough communication, (b) demonstrating strong project management capabilities, (c) mitigating the potential negative impacts of turnover of supportive leaders, (d) training leaders on problem solving and Six Sigma, (e) linking projects to KPIs, (f) understanding and planning for the constraints of the organizational structure, (g) using Six Sigma discerningly, (h) pursuing system ambassadors, (i) engaging senior leaders, and (j) developing a plan for system ownership. Each of these themes is discussed in more detail in the following sections.

Project managers who were responsible for implementing Six Sigma in various regions for the same corporation and leaders who manage the operations teams in those regions were interviewed to understand each group's perceptions of how project managers can obtain leadership support for Six Sigma implementations. The following discussion explains feedback from the project managers and leaders related to how project managers can garner leadership support for Six Sigma deployment. The links between literature, study observations, and

relevant archived documentation are considered in relationship to how project managers obtain leadership support and illuminated in the following segments.

Incorporate Six Sigma into Existing Programs

Project managers and leaders explained that three programs already in place in the company have incorporated Six Sigma tools into the existing processes, which has allowed the introduction of Six Sigma methods without leaders perceiving the system as more work or an additional task to manage (Interviews A, B, C, D, E, F, G, H, & I). Leaders voiced their gratitude for Six Sigma being embedded into the way work is done rather than being pushed as a new initiative because, as they stated it, their world is a world of tradeoffs (Interviews B, I, & L). This feedback is in line with one of the foundational concepts for this study, the Theory of Constraints, and helps to explain one of the ways project managers can motivate leaders to support Six Sigma. The researcher noted that Six Sigma methods are embedded in problem solving methods, Lean, Design for Vertical Start Up, and Project Life Cycle Management, which helps to provide the integration mentioned by the project managers and leaders. The literature review did not name Six Sigma integration into existing programs as a critical success factor to system deployment, but an understanding of Lean and problem solving was named as a factor for successful Six Sigma programs.

For the leaders, the theory of constraints defines their day-to-day challenge of defining the priorities of the shift and allocating resources to the priorities. Leaders expressed that in order for their teams to adopt a new initiative they have to let something else go (Interviews B, I, & L). They described their workload as being one that is greater than they can achieve in any given day, so the items that are not priorities or that do not provide quick payoff or return on their efforts are not pursued. Project managers and leaders explained that Six Sigma can be seen

as complex and cumbersome when it is presented as a new and different work stream to manage (Interviews A, B, C, D, E, F, G, H, & I).

Leaders would like project managers to remember how constrained their resources are, which was an underlying principle of this study. The theory of constraints explains there are limited resources and leaders must focus on the priorities of the business. Interview C explained the following:

> Project managers must show leaders how Six Sigma fits the business. If you can't show how Six Sigma fits the business, and if they look at it as a new job or new initiative, as opposed to it fits well with what we do and fits well with the culture, then your ability to succeed will be very low. Anybody in the position of leadership is given tasks and if they see Six Sigma deployment as a new task, as opposed to saying, "this will help you with the tasks you have at hand," you're going to have a hard time with getting the support you need (para. 9, sentences 1-3).

"Leaders struggle with the following challenges: Lack of time, lack of resources, lack of expertise, lack of support, lack of understanding of the Six Sigma approach" (Interview G, para. 5, sentence 1). The leaders suggested that project managers should be mindful of this and structure their communications and project updates to make the most efficient use of time. Related to this, both the leaders and project managers stated that the better Six Sigma is incorporated with existing business processes, the greater success project managers will have obtaining support from leaders.

Through the review of relevant documentation, the researcher noted that regions responsible for the highest volumes of production and change initiatives had the highest number of aborted projects. The data did not provide suggestions for why the projects were not carried through to completion. The interviews did not include questions about project success rate. The

researcher noted through observations that all of the open certification projects were progressing to schedule and had leadership involvement. Several Green Belt candidates expressed the challenge of managing the workload of Six Sigma projects and daily responsibilities. The case study did not result in findings that explain how the overall work demands should be managed, but both project managers and leaders agreed that when employees embark on Six Sigma certification they should be allowed adequate time to focus on their certification projects and the certification projects should be focused on work the leaders need to execute. The leaders explained that the time requirement should be communicated by the project managers working to implement Six Sigma and train employees prior to employees being accepted into the program.

During observations of employees striving to solve problems, the researcher noted Six Sigma was introduced as a part of a larger operating system at one of the manufacturing facilities represented. The focus of the system implementation was not Six Sigma or Six Sigma tools. Six Sigma methods were embedded within the problem solving tactics that the employees were trained to use when addressing issues adversely impacting efficiency, quality, or throughput. The meeting structure in the operating system is conducive for project managers to provide project updates and seek support from the leaders. Two managers in key positions at the site are supportive of Six Sigma and one insists that Six Sigma tools be used for complex problems. The researcher noticed that employees working at that site are clear on the expectations of their leaders as they engage in the operating systems and they treat Six Sigma as a means to fix complex issues. It is not clear from the interactions with these employees or the interviews if the acceptance of Six Sigma by employees and the success of Six Sigma implementation is more correlated with the evident leadership support or the fact that Six Sigma was introduced as part of the operating system. The observations do support the interview findings that Six Sigma should be how business is done and part of programs used in the organization. The observations

also support the assertions from literature and interview findings that Six Sigma success is benefited by leadership support.

Communicate

Both leaders and project managers explained through the interview process that communication is imperative for project managers to obtain the support of leaders (Interviews A, B, D, E, F, G, H, I, &L). Leaders want project managers to communicate to them about the benefits of the system and project status (Interviews B, F, I, L, & D). Project managers understand that leaders need to receive communications frequently so they understand the status of projects and what they need to do to help (Interviews A, E, G, & H). Both leaders and project managers explained the project managers should explicate their expectations of the leaders early in the process (Interviews B, E, F, G, H, I, & L). Communication is key for the two groups to work together to implement a Six Sigma system, and well-developed communication plans afford project managers an opportunity to convey the importance of leader support to the leaders.

Provide a vision. The project managers explained through the interview process that there should be a clear vision for system implementation and sustainment (Interviews A, C, E, & G). Project managers should provide the vision and plan to the leaders for the project and enlist senior leaders to provide communications that will explain the value the system will bring, when possible. The leaders must be involved in disseminating the message about the vision and plan for deployment and the value of the system to their employees. Kotter (2017) explained that leaders should establish a vision and direction for a change, and the responsibility leaders have for managing change serves as a foundational concept for this study. When project managers notice that leaders are not providing the vision and calling on employees to adopt the system, they may need to communicate their vision for the system implementation and partner with leaders to establish a plan for the leaders to communicate their vision to the employees.

Effective leaders have the ability to rally employees behind a change initiative and motivate them to adopt the change (Bolden & Gosling, 2006). Project managers rely on leaders to support the implementation by communicating the need to adopt the system and can impact the level of support provided through actively engaging leaders in executing the communication plan.

For project managers to help leaders develop a message to express their vision for the system, project managers may need to convey their vision for the implementation to the leaders in a structured way. A specific plan should be developed, and it should include the training plan and defined deliverables. The project managers should develop and communicate a timeframe for transferring ownership to the site level, and explicitly determine who at the site will own the system.

Throughout the implementation effort, the project managers should assess progress and correct course when needed. Observations made by the researcher provided that the transfer of ownership of the system is moving from the project managers to a team of Black Belts and Green Belts who are passionate about the system. Though, as the project managers explained in their interviews, passion for the system is impactful to a successful deployment and ongoing sustainment, this group of individuals does not have the authority to determine where resources are placed or if projects will be undertaken (Interviews A, C, & E). The transfer of ownership of the system may be more successful if it moves directly from the project managers to the leaders. Further study on this topic may verify whether or not a failed transfer of system ownership is a barrier to ongoing system sustainment.

Gap assessment. To gain leadership support, project managers should explain to leaders the likelihood of success through the use of Six Sigma. Conducting a gap assessment could be beneficial in showing the benefits of the system and engaging the leaders in developing a plan for implementation. Interview C provided the following:

> The biggest thing is the gap analysis to show leaders of the business why they should take the risk of deploying Six Sigma. The gap analysis could potentially communicate the benefits of the program, not only to the business financially, but also through the individuals trained in Six Sigma. As they grow in their ability to use the tools, out of sheer need they will begin to use the tools even outside of Six Sigma projects, they will be experts in manufacturing (para. 8, sentences 1-3).

As leaders understand what they can expect of the system and how it benefits them, they are more likely to support the implementation project. Project managers can follow this guidance to help leaders understand the importance of their support and motivate them to champion implementation efforts.

A gap assessment can help project managers understand which areas of the company are best prepared for the system introduction. Project managers should be aware of which areas or teams will be supportive of the implementation (Duarte et al., 2012). The leaders who have a good understanding of Six Sigma have the potential of being the advocates for the system that the project managers will need as they begin to launch the program. The project managers should enlist their support and deploy Six Sigma in their areas first to help show the remainder of the organization what can be accomplished through the use of the system.

Discuss needed resources. Project managers also explained that for the implementation to be successful and sustained, leaders must provide adequate resources for training and to support the project (Interviews A, C, E, & H). Several of the project managers suggested that it is valuable to set up time with the leaders to explain the value proposition of the Six Sigma implementation and ask the leaders directly for support through providing resources, supporting projects, and attending project phase gate meetings (Interviews A, E, & G). The leaders suggested this type of meeting would be okay, but they want the meeting to be brief and to be

guided by a one-page dashboard that will show progress to project goals, budget, and timeline (Interviews B, F, I, & L). They advised they want to know the status of the project and what is needed from them.

Correct false perceptions. A hindrance to increasing leadership support for a Six Sigma implementation is when leaders perceive Six Sigma as a competing effort to an initiative that they are driving. Interview C explained the following:

> A lot of times, because Six Sigma has been in parallel to initiatives these leaders may have been leading, Six Sigma may have been perceived as competing with the initiatives or taking away benefits of what they were leading, rather than seeing the opportunity of how the systems might go hand and hand, such as Lean and Six Sigma (para. 4, sentence 2).

Project managers should be mindful of instances where leaders may not see how systems complement each other and be prepared to explain the advantages of the systems functioning in tandem. "I have found success in getting support by making connections with the leaders of the other programs and making sure we are complementing each other rather than doing the same thing in different silos" (Interview A, para. 6, sentence 2). Project managers may have to be intuitive and ask effective and probing questions of leaders to discover when resistance to support projects has a link to their concerns about a negative result for their own initiatives. These leaders should be encouraged to consider the synergies provided by the two programs working in harmony.

Communicate project gains. The leaders advised that project managers should demonstrate gains or successes within their projects to obtain leader support (D, F, I, & J). The project managers acknowledged the paradox they face of needing leader support to execute projects effectively and needing victories within the project to obtain leader support (Interviews

A & C). Through observations, the researcher noticed that when early successes were well communicated to leaders, project managers were successful in garnering support from leaders. The leaders demonstrated support through communicating to other leaders what benefits were being realized and asking project managers about the status of the projects. The leaders were motivated to support the implementation and champion deployment efforts because of the benefits they could see in the early successes generated by the program.

One leader described project managers using communication boards on which project status, project wins, and successful projects were highlighted as a means to heighten communication to leaders about the successes of Six Sigma and reap their support (Interview B). This could be an answer to the research question of how project managers can motivate leaders to support initiatives. Most of the leaders did not ask for visual displays in facilities, but suggested that project managers use existing meetings as a forum for providing five to ten minute project updates to the leadership team (Interviews D, F, & I). Several leaders asked that project managers use a standard template of a one-page project dashboard with a yellow, red, green color coding to provide status updates to leaders, champions, sponsors, and stakeholders (Interviews B, D, F, & L). The researcher observed a training class for project managers and noted that a dashboard is not a tool suggested for communicating project status to leaders. They are trained to use the project charter in communication meetings. The project managers may find greater success increasing leadership support if this communication method is changed to use the one-page dashboard requested by the leaders during the interviews.

Choose terminology carefully. The language that project managers use when striving to communicate the value of Six Sigma and successes gained through the use of the system to leaders is important. "When I talk to leaders, I avoid terminology from the Six Sigma toolbox, I use generic language related to what they need to accomplish" (Interview A, para. 7, sentence 4).

The leaders may have a negative connotation of statistical jargon and respond more positively when project managers simply explain that the methods provided through Six Sigma will help improve efficiency, heighten throughput, advance quality, or reduce downtime. Leaders can be motivated to support implementation efforts when they understand the benefits they will receive from the system.

Communicate relevant examples of success. Leaders explained that they do not necessarily want to be given examples from other businesses or sites within the company; both project managers and leaders acknowledged that the examples shared should be relevant to the leaders in the audience (A, C, D, E, F, G, H, I, & J). Leaders expressed that they will support projects that seem to deliver something they value (Interviews B, D, I, & L). Interview C provided the following:

> Project managers should show evidence of success. Everyone who gives a Six Sigma overview starts out with Motorola, GE and Jack Welch, and the success they have had. That helps, but proof is in the pudding. Leaders want to see success at their companies, which would include projects that have made a difference (para. 10, sentences 1-2; 4-5).

Several project managers suggested that a high-level explanation of where Six Sigma has been successful in other companies may be helpful to begin the conversations and demonstrate how the system can be used, but project managers should take care to include relevant examples of success (Interviews A, C, E, G, & H). The leaders agreed that the examples that would be most influential to them would be success stories from their own sites, not stories from other industries, companies, or sites within their company (Interviews D, F, I, & J).

The topic of communicating success to garner leader support for Six Sigma implementations was not widely discussed in literature. This gap is understandable considering the absence of articles available to guide project managers in how to obtain leader support.

Eckes (2003) explained that leaders may be more supportive of the system when project managers provide evidence that the system is valuable. The research questions exploring how project managers can motivate leaders to support deployment efforts and commit to the system implementation are answered in summary by the explanations found through the interview process that project managers must effectively communicate the system value to leaders. Many articles about Six Sigma implementations began with explanations about how Six Sigma has provided improved performance and reduced expenses for organizations. The successes shared in these opening paragraphs suggest that when an audience is being introduced to why Six Sigma should be seen as valuable, relevant examples of success should be shared.

During of the beginning of the seven-week observation period, the researcher noted that project managers working to implement Six Sigma did not have a standard method for communicating Six Sigma wins to leaders. Throughout the observation period, the researcher noted that the project managers of individual Six Sigma projects capitalized on reoccurring meetings to provide updates to leaders. The archived data provided completed project information, but no indication of whether or not leaders received communication about the impact of the projects. The standard procedure documents available for the certification process indicate that leaders are supposed to receive end-of-project communications from the certification candidates as a requirement of Six Sigma certification. According to the documents available that outline the certification procedures, no requirement is currently in place for phase gate reviews or leader updates on a specified cadence.

Broadcast quick wins. One of the project managers explained that leaders need evidence of successful Six Sigma projects in order to buy into the system, and project managers working to deploy the system need leader support (Interview C). The paradox was noted and is in line with the concept that project managers own project success and project success is dependent on

leadership support. The project manager explained the best way to overcome this challenge is to find initial quick wins to demonstrate the value of the system (Interview C). As the leaders begin to buy into the system, the project managers explained that leaders should be explicitly asked for specific support or actions needed. The leaders validated this through their interview responses by stating that project managers should explain what is needed from the leaders during the phase gate reviews (Interviews B, F, & L). Through the document review, the researcher noted that the Six Sigma awareness training presented to leaders within the company included explicit instructions for the leaders to follow to demonstrate system support.

Prove system benefits. To garner support from leaders for a Six Sigma implementation, project managers must swiftly and thoroughly show the benefits of the system. Eckes (2003) explained that leaders will be motivated to support efforts they deem valuable, and the instructions provided through the interview process that project managers should communicate gains in terminology relevant to the leaders helps to answer the research question of how project managers can motivate leaders to support system deployments. Interview F provided the following:

> You have to be able to show the benefit, you have to be able to show that it is more than just documentation and paperwork and that there is a true method to madness of the DMAIC process. It can't be something that creates anxiety or pressures within the value streams. It has to be something we can live with on a daily basis and we are trying to make it better in the long term (para. 13, sentences 1-3).

Leaders cannot experience Six Sigma as another initiative to manage (Interviews A, B, C, D, E, F, G, H, & I). Project managers must take care to communicate the benefits of the system and present it as a beneficial tool for completing existing priorities and objectives.

Competency

Project managers can gain support from leaders when they are able to demonstrate their competency as project managers. The people leading implementation efforts must be skilled in project management and Six Sigma (Schroeder et al., 2008; Hilton & Sohal, 2012; Interviews A, C, & E). They will have to train and teach others, including leaders, about Six Sigma and how to use the tools in the system (Hilton & Sohal, 2012). The implementation projects are large-scale initiatives and must be meticulously managed. The project managers must be strong communicators and influencers to effectively lead system deployment. They must also follow project management tenets to ensure a successful Six Sigma implementation.

System success to date. As part of the case study, a review of the documentation that tracks system deployment statistics provided that Six Sigma has been deployed to 85% of the sites within the business segment studied. The employees at these sites have had the opportunity to build competencies through training and certification projects. Certified Six Sigma Yellow, Green, Black, and Master Black Belts represent 1.45% of the total employee population of the segment studied. Through the efforts of these employees, the Six Sigma system has generated $68.2 million in the ten years it has been in effect. Additional program statistics and information on the training structure are available in Appendix C.

The certification rate of employees who have attended trained are as follows: 1) Black Belt candidates have certified at a rate of 56.3%, 2) Green Belt candidates have certified at a rate of 29.4%, and 3) Yellow Belt candidates have certified at a rate of 67.7%. The researcher asked current certification candidates why they think the certification rates are not higher and everyone asked advised that one of the main reasons is changes in roles and responsibilities. They elaborated by stating that employees decide to pursue certification, but, before they are able to

complete the process, they shift to a new role where the project or certification is not as applicable to the work.

Skilled project managers. The team assembled to deploy Six Sigma should be experts in the system (Interviews A, C, & E). The project managers suggested continuity in the implementation team is impactful to garnering leadership support because the message they receive is consistent. "Make sure you have stability in your team, especially during deployment, which can last five to ten years, so the message is consistent" (Interview C, para. 11, sentence 1). This can be a challenge, but high-level leaders should understand the importance of the team assembled to implement a system.

The leaders are not in a position to coordinate the system deployment. They rely on comprehensive communication, coordination, and guidance from the project managers. Project managers who are skilled orators and influencers are more likely to be able to communicate the system benefits to leaders and help them understand their role in the deployment.

A talented and consistent team of experts on the system implementation team strengthens the likelihood leaders will support the system (Interviews A, C, & E). When Six Sigma deployments include a team of highly skilled and dedicated specialists to run or support the program the system is more successfully implemented and sustained because of the team's ability to explain the system and teach others about Six Sigma methods (Schroeder et al., 2008; Hilton & Sohal, 2012). These individuals are skilled at communicating with leaders and presenting the value of the system. They are experienced with engaging leaders and obtaining adequate levels of support for the system. The success of the system implementation to date in the corporation studied may be linked to the fact that the same highly-skilled team of six individuals who started the implementation effort are still working to deploy and sustain the system. Project managers charged with system implementations should do a self-assessment to

determine if they need additional development in the areas of project management or Six Sigma prior to embarking on the initiative so they will be able to build trust with the leaders and garner their support for the implementation project.

Develop and use influencing skills. Project managers cannot dictate what high-level leaders will require of mid-level leaders in way of project support. Literature provides that project managers are seldom in a position of authority over the project teams and leaders involved in a project (Hilton & Sohal, 2012). Literature also explains that they must rely on influencing skills to achieve necessary support for their projects (Gattiker et al., 2014). Project managers who struggle with influencing others may need to partner with someone talented in that area, or they may need to pursue training to develop their ability to inspire others. When striving to connect with leaders in an impactful way and motivate them to commit to and support implementation efforts, project managers should consider the leaders' insight that high levels of relevant and concise communication about the project objectives and successes can help project managers achieve the support required from leaders.

Refine training curriculum. The researcher observed a couple of gaps between what the interviews and literature provided and what project managers are trained to do. The literature expressed the critical impact leader support has on project success. Currently in the organization studied, project managers are not trained specifically about the importance of leadership support to project success. The project managers understand through experience that they must have leadership support. Through the current training curriculum, they are instructed to fill the roles of sponsor and champion, but no explicit instructions about how the project managers should communicate the project benefits or expectations of the leaders in the roles of champion and sponsor were provided. There is not in-depth discussion about who should be chosen to serve as sponsor and champion or what should be required of these roles. Also, project managers are

trained to use the project charter in ongoing phase gate meetings, but the leaders suggested a one-page dashboard would be a more effective means of communication (Interviews B, D, & F). Interview F provided specific information about the dashboard.

> As a leader of the site, I don't want someone to take me through all the minute details. I want to be able to ask questions. Show, "This is where I am, I am on schedule/or not, these are the roadblocks I have and what I need you to do to help" – what support do you need from me to remove roadblocks? It is high level: status to schedule, support needed, what you need from me, whether you have adequate resources, when will it be completed. Again, very high level with an opportunity for me to dig in where I choose, not necessarily a 45-minute journey of where the team has been (para. 9).

Project managers should consider the leaders as customers to their implementation projects and find out how the leaders want to receive communications and structure their approach accordingly. When project managers do well on this task, they will be able to motivate the leaders to commit to deployment initiatives and to support implementation efforts.

Mitigate Impacts of Turnover

Project managers are trained that turnover can adversely impact project success when supportive leaders change roles. Turnover of key stakeholders to a project was not mentioned in literature as a risk to project success. Interview C explained the following:

> Specifically within this company, the turnover of key individuals is frustrating. You can get buy in from a plant manager and it changes tremendously the use and application of Six Sigma at that site. As soon as that plant manager leaves and a new one, who may not be familiar with Six Sigma, comes on board you are starting all over again to drive that culture within that leader because that leader will impose on his subordinates what is

> important to him. If Six Sigma isn't a part of the priorities, it won't be important to the subordinates, value stream managers, etc. (para. 7, sentences 2-4).

Interview C explained that counter actions that project managers can take to mitigate the risk to project success of turnover of key personnel during a project are to ensure good documentation and communication so the people hired to fill the vacated roles can easily be brought up to speed. If the roles are not filled during the course of the project, project managers are faced with determining the severity of the risks imposed on the project and escalating barriers timely. Though this finding does not explain how project managers can garner leadership support, it explains that project managers must be aware that when leaders who are supportive of implementation projects change positions, their projects can be adversely effected. They should recognize this as a risk and have a risk mitigation plan in place.

Foundation of problem solving. The literature suggested that project managers working to implement Six Sigma would have greater success if the organization had experience in improvement systems and problem-solving methods. When organizational leaders have had experience with problem solving systems, they are more likely to support Six Sigma (de Carvalho et al., 2014). Considering this guidance, the observations made, and the provisions from the interviews, perhaps project managers striving to implement Six Sigma in an organization should introduce lean concepts and basic problem solving practices prior to presenting Six Sigma as a system to solve complex problems. Project managers may be able to include these topics in management awareness training as a ploy to gain leader support. Leaders may be more apt to consider Six Sigma a portion of the overall program if this approach is pursued.

Train leaders. The project managers explained that the leaders who are most supportive of Six Sigma implementations are the leaders who are most knowledgeable about the system

(Interviews A, C, E, G, & H). For this reason, the project managers advocated Six Sigma awareness training for leaders (Interviews A, E, & G). The leaders did not mention training as something they felt they needed. All of the leaders interviewed provided a good explanation of the purpose of Six Sigma. The disconnect between project managers and leaders on whether or not training for leaders is helpful in garnering support from leaders may be due to the focus of their work.

Another project manager explained there are challenges with attempting to deploy Six Sigma with the same model at sites with varying maturities and understandings of a problem solving system, and these conundrums are exasperated when there are no requirements for using the system (Interview E). De Carvalho et al. (2014) explained that leaders who have had experience with problem solving systems do better to successfully adopt Six Sigma because they know how to employ the tools. The project managers expressed that they have found that leaders who are more skilled with problem solving and Six Sigma are more supportive of the system (Interviews A, C, E, G, & H). The training structured for leaders should include information on how embedding Six Sigma tools and methods into the structure for problem solving can help employees find effective and sustainable solutions to complex issues.

The researcher noticed through observation and noted in the interview responses that leaders seem open to the idea of allowing their resources to participate in Six Sigma activities, as long as the project scopes are well defined, but their primary objective each day is to achieve production volumes (Interviews B, D, F, I, & J). The project managers are focused on a long-term strategy to reduce wastes in systems. While leaders would be happy to have waste reduced, they must devote their resources to achieving the expectations of their leaders. Presently, the priority of their leaders is to achieve the daily production targets. As described in the theory of constraints, leaders must determine what work is the most important work and devote resources

to completing the tasks that will accomplish the priorities. Leaders should be trained on how they can support their employees in the use of Six Sigma methods to assist them in achieving the targets.

Integrate the System into the Culture and How Work is Performed

The leaders explained that in order for a Six Sigma implementation to be supported by the leadership team, Six Sigma will have to be built into the culture of the organization (Interviews B, F, & I). They acknowledged that the system deployment is a change that needs to be managed well and it requires a cultural shift. "If we want these initiatives to be successful, has to be part of culture and how we operate" (Interview F, para. 4, sentence 2). Six Sigma should be incorporated into existing processes and should be how employees achieve corporate objectives. Though project managers may be limited in their sphere of influence on this topic, they can find ways to integrate Six Sigma into existing procedures.

The researcher observed that, though there are few Six Sigma projects open at each site, a problem solving card is being introduced to the operations teams and seems to be widely accepted. The tool is being rolled out through a corporate Lean initiative which names Six Sigma as the tool to be used for complex problem solving. The project managers and leaders mentioned the Lean program as a means to standardize the triggers for when Six Sigma will be used in problem solving. The project managers were encouraged that the acceptance of the Lean system may mean a greater acceptance of Six Sigma as the method to address large-scale issues. The problem solving card is structured to follow the DMAIC method used in Six Sigma and it requires the use of the same tools used in Six Sigma to define a problem. This approach should establish a foundation on which Six Sigma projects can be deployed if basic problem solving efforts are not successful at resolving the issue. The Lean system deployment is a mandate from

the highest levels of the organization, and the leaders seem to be in support of the program. They are providing resources for the work and training.

Ensure continued use of tools. Through observation of how problem solving efforts are managed in a North American plant of the company studied, the researched concluded that Green Belt certified employees do not often take on projects beyond their certification projects. This can be a hindrance to system sustainment since system methods are not being used to address problems. Several project managers postulated Green Belts do not continue to work projects after certifying as Green Belts because no requirement to work projects is included on their performance objectives. The leaders agreed that expectations for system use should be included in performance reviews once the employees are certified in Six Sigma (Interviews B, D, F, I, & J). The project managers suggested that some job descriptions should include Six Sigma as a required skill set and projects should be required of the employees (Interviews C, E, G, & H). Along with this, the project managers explained that leaders demonstrate their support for the system by creating roles to focus on this type of work (Interviews C, E, G, & H). These items are beyond the realm of control for project managers, but they should communicate these needs to high-level leaders and make suggestions for the types of roles that would be beneficial to the system. This would give leaders the opportunity to support the system through work design and job development.

Resource Availability. The researcher observed that the programs the company currently has in place that calls for the use of Six Sigma tools and methods helps to present a requirement for use of the system. Several project managers explained that these programs and systems will help generate support from leaders and a demand for Six Sigma training for employees (Interviews A, C, & E). The project managers also suggested that leaders would ultimately be required to devote resources to this type of work since these programs are audited

by external agencies (Interviews A, C, E, & H). The project managers warned that Six Sigma sustainment could be jeopardized if there are not enough resources trained to execute projects or if those trained are not able to perform at a high level (Interviews A, C, E, & H). Several project managers agreed that the longevity of Six Sigma would be impacted by the ability of the Green Belts and Black Belts to deliver successful and timely projects (Interviews A, C, & H). Project managers must ensure they have effective training plans in place for the system deployment so that adequate resources are available to execute Six Sigma projects. The successes gained will help increase the level of support leaders provide for the implementation.

Ensure Projects are Linked to KPIs

The sentiments expressed by the project managers that the projects selected must be linked to business objectives and activities already on the leaders' plan parallels many of the findings in literature. The projects undertaken must be linked to business objectives (Gošnik & Hohnjec, 2009; Moran & Youngdahl, 2008; Taner, 2013) and employees should understand the connections (Antony, 2014). In the interviews for this study, both the leaders and the project managers explained that project managers should focus on making sure that Six Sigma is perceived by the leaders as a tool to achieve the work that needs to be done to meet KPIs (Interviews A, B, C, E, F, G, H, I, K, & L). "It isn't about convincing business leaders, but rather making sure what we are doing is in line with what our business is doing" (Interview A, para. 6, sentence 2). Interview B provided the following:

> You will really get buy in from leaders when a project is focused on where the site needs to improve anyway. So if we use project managers to work on issues and improve on KPIs at the site that are driven by top losses, that gains leadership support shows that this is what we need to work on and work towards (para. 2, sentences 2-3).

The project managers suggested the best way to garner leader support for an implementation effort is to make sure leaders understand how KPIs will be improved and how the system will provide value to their teams and the organization. Project managers should communicate how Six Sigma is successfully achieving organizational goals and objectives to leaders during project selection and status update meetings to enhance the level of support leaders will provide for the system implementation.

Consider Possible Constraints of the Organizational Structure

An outlier in the interview, data is a comment made by one of the project managers pertaining to the structure of the organization (Interview E). The project manager explained that the matrix organization structure presents a challenge to project managers seeking to deploy Six Sigma because there are no requirements for using Six Sigma tools and methods consistently across the sites. Interviews D and L explained that project managers must have top-down support in each area of the business where Six Sigma will be deployed, and this support includes a requirement made by the leaders for the system to be used to solve complex problems. The literature and interview feedback warned that matrix corporations will experience this struggle (Antony & Banuelas, 2002; Interviews D & E).

Large companies that can be divided into multiple factions under a myriad of leaders may be more difficult to guide through a change initiative such as a system deployment. Baía (2015) contended smaller or mid-sized companies may have the advantage of having fewer complications in implementation efforts. Baía (2015) suggested Six Sigma could be used to improve organizational design and restructure processes. In doing so, project managers can demonstrate to leaders how teams can connect to reduce waste and focus on the customer with the use of Six Sigma (Baía, 2015). Though this idea was presented in only one interview, the fact that the concept was also presented in literature suggests that project managers should

consider what tactics should be employed to garner leadership support in situations where the organizational structure may present a challenge to implementation efforts.

Use Six Sigma Discerningly

The leaders provided guidance that projects chosen within the system should be related to KPIs, linked to the work the operations team is already doing, and scoped properly (Interviews B & L). They also suggested that full Six Sigma projects should not be initiated unless the problem is complex enough to require a large-scale effort (Interviews B & L). They explained that successful projects that are impactful in solving issues leaders need solved will help improve the level of support provided by leaders (Interviews B & L). Several of the project managers echoed the sentiment that leaders have experienced situations where Six Sigma was overly complex and became unnecessarily bloated (Interviews A, C, & E). They acknowledged this hindered their ability to keep leaders engaged in the system. Project managers should be mindful of this challenge and develop and communicate project selection methods that will ensure Six Sigma projects are linked to KPIs. Leaders will be more apt to support a system they perceive as valuable for helping them accomplish their goals.

Pursue System Ambassadors

Through a review of the archived data, the researcher determined that the region with the greatest success with certifying employees is the region where the system was first deployed. The reason for this was not clearly evident, but the project managers explained that the leaders were supportive of the implementation in that region. The project managers described two high-level leaders who were impactful in garnering support from other leaders (Interviews A & C). Interviews A and C explained that these leaders were ambassadors for the program and they shared their excitement about project wins with other leaders. The leaders set up meetings to share successes found through Six Sigma with other leaders and to be available for questions

about how they were using the system to achieve KPIs. This set the stage for the project managers working to deploy the system. The same level of sponsorship has not been present in other regions, and the certification rates are not as high for these regions.

Project managers cannot guarantee this level of support from leaders, but, since the impact of this type of support is so great on deployment success, project managers should focus on actions they can take to garner leader support of implementation efforts. When leaders are supportive of the system, project managers should ask them to be ambassadors for Six Sigma and explain to them what they can do to help. The leaders may be able to help communicate project success with other leaders. The message being shared amongst peers and colleagues may enhance the relevance of the message that is perceived by leaders.

Senior Leader Involvement

Project managers need backing from senior leaders prior to embarking on a system deployment. The project managers should ensure that the communication plans they develop include messages from senior leaders to other leaders responsible for supporting and adopting the system being implemented. Project managers may determine that periodic communications from the senior leaders are needed to ensure that leaders throughout the organization understand how the project is impacting the organizational objectives. Project managers must share with the senior leaders the communication requirements deemed necessary to obtain support for the system deployment.

The researcher noted during observations that a large-scale project to implement Total Productive Maintenance (TPM) was fully supported by leaders. The initiative was mandated by the highest level leaders in the organization. These leaders provided a timeline to mid-level leaders for certain expectations and milestones to be achieved. The manufacturing site leadership team was fully engaged in supporting the project managers charged with

implementing the program. The site leadership team took full ownership of implementing the system. In the same manner, the site leadership team took full ownership of introducing a broader project to implement the Focused Improvement and Leadership pillars of the lean system being introduced to Operations. The involvement and communication from the senior leaders helped leaders understand the importance of the program and the expectation senior leaders had for engagement from mid-level leaders. This positively impacted the implementation of TPM. Project managers can consider this success story and how they can enlist senior leaders to help them gain the support of mid-level leaders in the production areas.

System Ownership and Sustainment

All of the regions struggle with the same issues regarding Six Sigma sustainment. The project managers described these as turnover of key individuals, leadership supportive of the system moving to areas of the business where Six Sigma is not perceived as being highly impactful, and lack of sponsorship by leaders. Additionally, there are few open Six Sigma projects at each site.

The project managers interviewed explained that the success of a Six Sigma implementation effort and the sustainment of the program is dependent on leadership support and ownership. The project managers and leaders interviewed acknowledged that the only roles that require Six Sigma application are in Research and Development (R&D). Project managers expressed they are aware that leaders consider Six Sigma an R&D function, not something that Operations should own or execute (Interviews A, C, & H). Leaders confirmed this belief to be true through their interview responses (Interviews D, F, I, J, & L). A recommendation for project managers striving to implement Six Sigma is to ensure during the ideation or initiation phase of the project that high-level leaders make the expectations of ownership clear to all parties involved in the implementation.

The leaders explained, and two project managers also stated, that the core function of leaders is to produce product to be sold (Interviews A, C, D, F, I, & L). Two project managers explained that leaders seem to expect the R&D functions to complete Six Sigma projects with minimal support from the operations teams (Interviews A & H). If these project managers are correct, this suggests that leaders may believe Six Sigma can work but they are not bought in enough to invest their own resources into the system. Additional support for the idea that they are not fully bought into the system is that the majority of the project managers and several leaders provided that leaders do not care what method is used to solve problems; they just want the problem solved quickly and the solution sustained (Interviews A, C, D, E, F, H, & L). A seasoned project manager explained that mid-level leaders will do what is required of them by their leaders (Interview C), and there was a consensus among project managers that the system must be supported from the top down throughout the organization (Interviews A, C, E, G, & H).

Ensuring leaders take ownership of the system and require their employees to use the system are not factors that project managers can directly impact. Project managers can influence the leaders by educating them about their roles in the system. Project managers should make leaders aware early in the deployment process that the project managers will lead the effort to implement the system, but the overall responsibility and sustainment of the system is owned by the leaders. Project managers should communicate a planned transition or handover date for when the leaders will be given ownership of the system. They should make the expectations of system ownership clear to the leaders. When the leaders understand these expectations upfront, they are more likely to be receptive and supportive of the transition of ownership.

Study Triangulation and Saturation

The study design of using interviews of both leaders and project managers and comparing interview responses to observations made by the researcher provided triangulation. Saturation was achieved quickly through the interview process because project managers were in high agreement with each other and leaders expressed similar sentiments with one another. There were also corresponding themes between interview groups. The observations confirmed some of the information obtained through the interview process.

Summary of the Findings

Combining the information obtained through observations and interviews, project managers can understand how to obtain leadership support for Six Sigma implementation projects. Effective methods project managers can use to garner leadership support include demonstrating project wins, sharing relevant examples of successful projects, conducting periodic update meetings, communicating project status and needs with a dashboard, and asking leaders for the support needed. The value of this study is that leaders and project managers with experience implementing Six Sigma had an opportunity to express what they have learned. These experiences paired with what literature suggested help provide a foundation for a framework for project managers to follow when seeking to obtain leadership support for system implementation.

The leaders and project managers were not aligned on which categories project managers should prioritize in order to obtain leader support for system implementations. Figure 2 shows that project managers put the greatest emphasis on building competencies, demonstrating project success, and integrating Six Sigma into the culture and how work is done. Figure 3 shows leaders believe project managers should focus on communication, good project management practices, and building competencies in order to garner leader support. Project managers should

consider the leaders' responses as guidance and recognize that their customers feel differently about what is most important to obtaining leader support than they do. This difference should guide project managers as they work to modify or develop the methods used during system implementations to ensure that they put focus on communicating the way that leaders desire, using sound project management techniques, and building competencies.

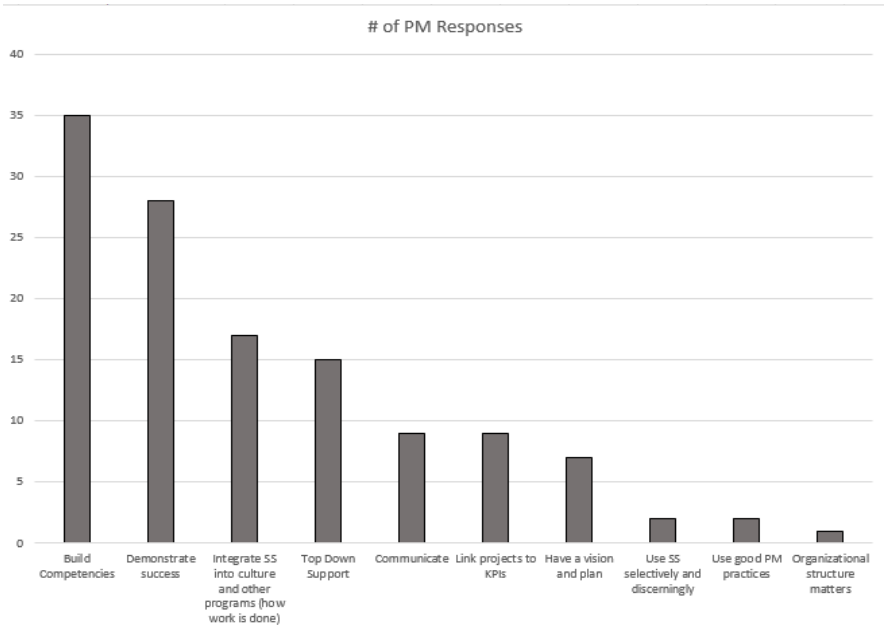

Figure 3. Project Manager Responses.

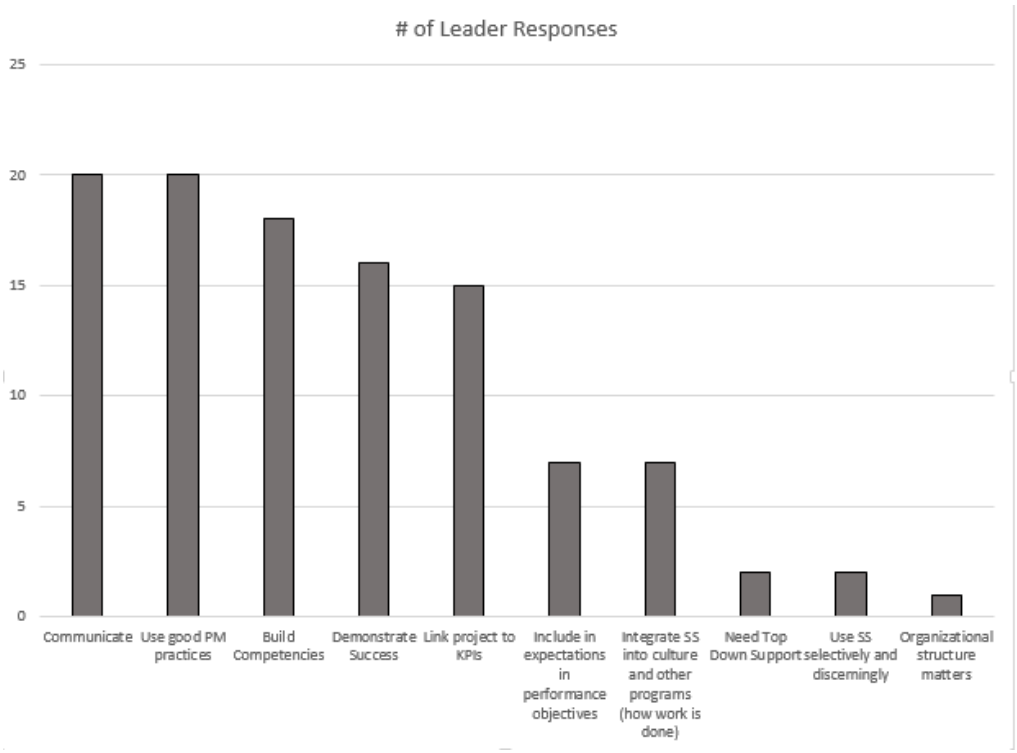

Figure 4. Leader Responses.

Applications to Professional Practice

The findings of this study addressed the associated research question: How can project managers successfully obtain leadership support for Six Sigma implementations? This section explains the applicability of the study findings to the professional practice of project management. An assessment of how the findings are relevant to enhancing the professional practice of project management is also provided. Links between the findings and the biblical framework of the study and the academic field of project management is discussed as well.

How Project Managers Obtain Leader Support

Previous studies recorded in literature that defined critical success factors for system implementations hinted at key actions project managers can take that may prove successful in garnering leader support of their projects. These points can be grouped into the following categories: (a) define the project scope (Ireland, 1992), (b) set direction and expectations

(Bowenkamp & Kleiner, 1987; Anantatmula, 2010), (c) communicate (Bowenkamp & Kleiner, 1987; Brun, 2011), (d) link projects to strategic objectives of the company, (e) be skilled in and use strong project management practices (Hilton & Sohal, 2012; Rapaka, 2017), and (f) demonstrate quick wins (Eckes, 2003). The studies were not focused on providing hypotheses for how project managers can obtain leadership support, but portions of the discussions in the studies were beneficial to explaining what duties belong to project managers and what elements help increase the likelihood of a successful implementation. The interviews conducted in this study help to elaborate on the information available in literature by providing specific instructions for project managers to follow to acquire support from leaders for Six Sigma implementation efforts.

Integrate Six Sigma. Perhaps the most significant finding of the interviews and case study was that when Six Sigma is integrated into already-existing programs, the company culture, and how business is conducted leaders are more likely to support the system. Leaders and project managers alike provided that, because leaders face the challenge described by Goldratt and Cox (2004) in the Theory of Constraints, their jobs require constant tradeoffs and prioritization of tasks. Project managers must be aware of this phenomenon and find ways to embed Six Sigma into existing processes, procedures, or programs in order to have adequate support of leaders (Interviews A, C, &E). When Six Sigma is the way work is completed, leaders will expect that their employees will be trained in the methods and use the tools to solve complex problems. The literature did not discuss this as a challenge for leaders in the context of supporting Six Sigma implementations. The interview participants acknowledged the challenge for leaders and explained that if project managers are going to find success in obtaining leadership support, they will have to understand the capacity and resource constraints leaders face and find ways to mitigate the risk that Six Sigma will be perceived as additional work.

Communicate. Literature and interview feedback explained that project managers must communicate well in order to find success garnering support from leaders for implementation efforts. Communication was the theme most often presented by leaders in their interviews. Bowenkamp and Kleiner (1987) explained effective project managers communicate effectively with leaders, ensuring they know the status of projects and when their help is needed. Interview K explained that Six Sigma is something not well understood by many leaders and, for this reason, can invoke fear. Interview K continued that project managers should strive to communicate well and often to reduce anxiety and heighten comfort with the system. Leaders explained that project managers should explicitly communicate with leaders how much time will be required of their resources and what the benefits of the project will be (Interviews B, F, & L). Leaders also suggested the project managers conduct periodic meetings to provide the progress of projects and communicate barriers and risk to leaders (Interviews B, F, I, & L). Leaders expressed a desire for project managers to use a one-page dashboard to communicate project status and risks and keep meetings brief, focusing on the highlights (Interviews B, D, F, I, & L). Interviews A and D both provided that project managers should avoid Six Sigma jargon when communicating to leaders. Communication forums and methods are important to explaining the benefit of Six Sigma to leaders and obtaining their support for the system.

Top-Down support. There must be support for a Six Sigma system from the highest levels of leadership for a deployment effort to be successful (Antony & Banuelas, 2002; Brun, 2011; Swami & Prasad, 2011; Ho et al., 2008; Kornfeld & Kara, 2013). Mid-level leaders will be focused on the priorities of their leaders. Project managers and leaders need support from the highest levels of leadership for Six Sigma to be effectively deployed (Interviews A, C, D, E, G, & H). Project managers striving to implement a system should consider the impact that high-level leaders have on how work is prioritized and develop action plans to ensure this support is

well demonstrated throughout system deployment. They should include communications from the highest levels of leadership as part of the communication plan and ensure they have a commitment from those leaders to participate in explaining the value of the system and their expectations that the system will be used.

Communicate Vision. Project managers should have and communicate a vision and a plan for their system deployments in order to obtain leadership support (Taner, 2013; Interviews A, B, C, E, and G). They should be mindful to use Six Sigma selectively and discerningly. Leaders become disengaged from the system when the tools and methods are used in effectively ways (Interviews A & E). Project managers must be careful to reserve Six Sigma tools for solving the most complex of issues to preserve the credibility of the system.

Expectations. During the case study observations, the researcher noted that the project managers explicitly state what is expected of the leaders as part of the awareness training provided to leaders. The expectations of the technical managers, which are mid-level leaders in the organization, include the following: technical managers have the responsibility to (a) ensure successful and timely execution of improvement projects pursued within the Six Sigma system for their areas, (b) motivate project managers to remain on track to their timelines for improvement projects pursued, (c) remove road blocks for project managers, (d) ensure project managers have adequate time allocated in their schedule to devote 20% of their time to improvement projects, (e) ensure project reviews are scheduled outside of normal staff review meetings, if necessary, and (f) attend weekly project reviews with the project manager. Leaders expressed that project managers striving to implement a Six Sigma system should explicitly communicate what is expected of the leaders (Interviews B, F, & L).

Demonstrate wins. In order to obtain support from leaders for Six Sigma implementations, project managers should be diligent to demonstrate quick wins (Eckes, 2003).

Leaders contended that project managers should show a track record of success and have relevant examples to share (Interviews B, I, D, F, and J). Leaders can have the perception that Six Sigma takes too long and is ineffective because they have not seen the system be successful (Interviews D & F). To combat this negative view of the system, project managers must be prepared to show examples of projects that were completed in short time frames with successful and sustainable results (Interviews A, C, D, E, F, and H). Leadership support can be gained through demonstrated success of projects that are aligned with business needs and communicating to leaders what they will gain through the use of the system (Interviews C, E, and G). Project managers must find avenues to communicate and demonstrate the successes realized through the use of Six Sigma in order to achieve adequate levels of support from leaders.

Links to KPIs. Project managers must ensure projects chosen are well linked to corporate objectives (Antony, 2014; Gošnik & Hohnjec, 2009). The project managers striving to deploy a Six Sigma system should be careful to explain how the system will help leaders achieve their goals (Interviews B, C, D, E, F, G, H, L, & I). If Six Sigma is not perceived as something important or that will help deliver essential results, the support leaders have for the system will wane (Interview C). Once leaders understand how Six Sigma will positively impact their metrics, they are likely to ensure their employees have expectations written into their performance objectives to use the system to solve complex problems (Interview B, D, F, I, & J). This is one way leaders show support for the system.

Strong project management. Project managers must use strong project management methods to find success in garnering leadership support. The interview feedback received from leaders listed good project management practices as the second most effective way to obtain support from leaders. The leaders explained that project managers should define manageable

scopes for their projects, get leadership alignment on the scopes early in the process, manage leader expectations, and communicate barriers timely (Interviews B, D, F, & L). Interview A and E agreed that manageable and explicitly defined project scopes were important to Six Sigma implementation and sustainment. The leaders consider strong project management skills and practices as an important element for project managers to be effective in acquiring support from leaders. In the ten themes identified from the project managers' interviews, strong project management practices fell at number nine when being ranked by the number of times a theme occurred during the interviews. Project managers should be diligent to build and apply project management capabilities when working to implement a system (Hilton & Sohal, 2012; Rapaka, 2017; Anantatmula, 2010; Ireland, 1992).

Build competencies. The success of a Six Sigma implementation depends on the maturity of the leaders and employees who are meant to use the system (Gutierrez et al., 2016; Duarte et al., 2012; Interviews A, E, & G). Project managers must understand that support comes from leaders who are knowledgeable about Six Sigma (Interviews C, H, B, D, F, I, L, & D). Project managers should include a training plan in their implementation plans to ensure leaders and employees are adequately trained about the system benefits and expectations (Little, 2011; Marzagão et al., 2014; Kumar et al., 2011; Enoch, 2013; Moosa & Sajid, 2010; Suresh et al., 2012; Douglas et al., 2015; Taner, 2013; Pinedo-Cuenca et al., 2012; Interviews A, E, & G). The project managers interviewed described the training they used specifically for the leaders as an awareness training. The training was focused on explaining the benefits of Six Sigma and the leaders' role in the system implementation.

The project managers chosen to lead system implementation efforts must be well-trained and knowledgeable about project management methods and Six Sigma (Rapaka, 2017; Interviews A, C, E, H, and L). Interviews C and G explained that turnover is a barrier to system

implementation and sustainment because of the loss of Six Sigma knowledge. Project managers should be aware of the impact turnover can have on system implementation and sustainment and strive to have several leaders serving as advocates for the program to buffer a shift in personnel that adversely effects the implementation effort.

Organizational structure. The structure of the organization can impact the levels of support leaders will provide. If the organization is divided amongst multiple leaders and sections, project managers may find differing levels of commitment to the system throughout the organization (Interviews D, E, & L). The project managers need to have ways to determine which areas of the business are most likely to support Six Sigma and target those sections for deployment.

Biblical Framework Implications

The biblical framework for this study consisted of project managers having a plan and vision, committing through adversity, and demonstrating leadership. The study results provide cause for considering the biblical inferences of increasing in understanding and committing to a philosophy or cause. Another element of the biblical framework included God's purpose for business. The findings of this study described actions and behaviors project managers can pursue or demonstrate to acquire support from leaders for system implementations. The implications of the findings in regard to the biblical framework are discussed in the following sections.

Commitment. The study provided that project managers need support from business leaders to be able to implement Six Sigma successfully. Business leaders support the Six Sigma system by creating roles to related to Six Sigma application, communicating the value of the system, attending meetings, allowing project managers autonomy, allocating resources for projects, providing resources for training, and promoting Six Sigma with their peers (Interviews

A, C, E, G, &H). Before leaders will choose to commit to a system deployment at this level, they must be educated on the value Six Sigma will bring to the business and their teams. Project managers must teach the business leaders about the benefits of Six Sigma so they can obtain their support.

The interviews included in this research provided that the best way to garner leadership support for a system is to integrate the system into existing programs, procedures, or processes. Business leaders are slow to commit to something new to manage. Their support will be more easily obtained if a system is presented as a tool to achieve the results the leaders already need to deliver. Project managers can achieve support from leaders when they present the Six Sigma system as a way to complete the work that needs to be done.

The struggle leaders will have with supporting a system if it is perceived as extra work can be understood by people who have attempted to live a Christian life in only certain compartments of their lives or in their own strength. Each person is limited by time, resources, and strength. Christians understand they are able to fellowship with God only by His grace and strength. A walk with Christ must be pursued with commitment to Him. God gives Christians all they need to be able to follow Him faithfully. Ezekiel 36: 26-28 (ESV) says, "And I will give you a new heart, and a new spirit I will put within you. And I will remove the heart of stone from your flesh and give you a heart of flesh. And I will put my Spirit within you, and cause you to walk in my statutes and be careful to obey my rules." Christians rely on the Holy Spirit to guide them and to help them integrate their faith in every facet of their lives. "And I will ask the Father, and He will give you another Helper, to be with you forever, even the Spirit of truth, whom the world cannot receive, because it neither sees Him nor knows Him. You know Him, for He dwells with you and will be in you" (John 14: 16-17). Christians do not add God's statutes as something else they have to do; they make following God the way they live their

lives. The biblical application to the process of obtaining leader support for a system implementation is that leaders do not have the capacity to take on extra work, but they can adopt the system as a means for accomplishing existing responsibilities and achieving goals. Six Sigma should be seen as how the work is done, not a separate system to manage.

The project managers interviewed understand that leaders cannot support a system that will be another program to manage. They need Six Sigma to be integrated into the culture and the way work is done. When that happens, leaders can be educated on the system and can learn to manage priorities while using Six Sigma as a tool to achieve results. Once leaders understand the value of the system, they can commit to following the system.

Just as leaders explained that they find it difficult to support a new system or implementation effort in addition to all the other priorities they manage, people can misinterpret a relationship with God as something else to do when they do not understand that a walk with God is a way of life. People will struggle to add biblical constructs and principles as additional tasks to accomplish. They must fully commit their lives, and all aspects of their lives to abiding by God's will to completely experience a walk with Him. Scripture calls Christians to meditate on God's word, apply it to their lives, and abide by the Bible's teachings in every aspect of their lives. In Philippians 4:9 (ESV) Paul instructs Christians, "What you have learned and received and heard and seen in me-practice these things, and the God of peace will be with you." As Christians study God's word, they are provided an understanding that comes through His provision. Psalm 119:11 (ESV) provides, "I have hidden your Word in my heart that I might not sin against you." Deuteronomy 11:18 (ESV) states, "You shall therefore lay up these words of mine in your heart and in your soul, and you shall bind them as a sign on your hand, and they shall be frontlets between your eyes." James 1:22 (ESV) instructs, "But be doers of the Word, and not hearers only, deceiving yourselves." The more Christians learn about God and what He

has for them, the greater their commitment to walk according to His will, guidance, and statutes. The more committed Christians become to their walk with Christ, the more their lives are benefited.

As people become more educated on a topic, they become more comfortable following established processes and procedures. As leaders learn more about how Six Sigma works and the value the system provides, they begin to understand their roles in the system and how to guide employees to use the tools provided. The leaders must commit to the system, learn about the system, and apply the tools and methods of the system to realize the benefits Six Sigma can provide to their departments and the business.

Excellence. Six Sigma is a means to achieve enhanced business performance. Leaders should support project managers in their efforts to implement Six Sigma, but they may not understand how effective the system is at delivering results. Project managers should demonstrate examples of where the system has been used successfully to achieve strategic objectives of the business. Once leaders understand Six Sigma can help an organization work toward greater efficiency, throughput, and quality, they should capitalize on the tools available in the system to generate improved performance.

The biblical construct that links to striving for excellence in business is the idea that Christians should present all work and effort to the Lord. Colossians 3:23 (ESV) states, "Whatever you do, work heartily, as for the Lord and not for men." Each person should strive to be productive and grow in knowledge. "And so, from the day we heard, we have not ceased to pray for you, asking that you may be filled with the knowledge of His will in all spiritual wisdom and understanding, so as to walk in a manner worthy of the Lord, fully pleasing to Him: bearing fruit in every good work and increasing in the knowledge of God" (Colossians 1:9-10, ESV). The implication of these principles to project managers striving to achieve support of leaders is

that business leaders should be seeking to guide organizations to perform at the highest levels or quality and productivity. Project managers should explain the methods Six Sigma provides for improving performance in these areas.

Application

Much of the information shared in the interview process was not discussed in literature. The project managers and leaders interviewed have experience implementing Six Sigma and understand the challenges associated with a large-scale system deployment. The advised they provided should be considered by project managers. If project managers develop implementation plans with this guidance in mind, they will have an opportunity to avoid barriers to successful implementations and deliberately pursue support from leaders in an effective manner.

Recommendations for Action

Through the feedback provided in the interview process, findings from literature, and researcher observations, several recommendations of actions have been formulated. Each of the suggested actions are geared toward aiding project managers in obtaining leadership support for projects. The underlying concepts are that leadership support is imperative for project success and project managers are responsible for the success of their projects.

The leaders expressed a desire for strong and frequent communication about the project status and needs from the leaders. Project managers should develop a multi-level communication plan to ensure all levels of management are aware of the vision and plan for the Six Sigma implementation project and the status of the project. Project managers should also take care to create a structure for project managers working within the system to keep managers informed on project status, barriers, and risks. The project managers should communicate explicitly to leaders what is expected of them. Project managers should be mindful as they

construct their communication plans of the guidance leaders provided that project managers should use existing meetings, when possible, or hold brief project status update meetings and use tools such as project communication boards or a standard, one-page project scorecard or dashboard.

The project managers may find success increasing leadership support of projects if they use the one-page dashboard requested by the leaders during the interviews. According to the leaders, this document should be color coded, brief, and easy to follow. The leaders provided that the document should be formatted so that the project status, risks, and barriers are clearly evident. The leaders also asked that the document have an area where required actions of the leaders are explicitly stated.

The researcher observed that the leaders with experience in continuous improvement, lean, and problem solving were more supportive of the Six Sigma implementation. The feedback provided by the project managers and leaders through the interview process confirmed this observation. The literature explained this is typically the case. Based on this information, project managers charged with implementing Six Sigma should first introduce lean concepts and basic problem solving practices prior to presenting Six Sigma tools. Leaders may be more apt to support Six Sigma if it is positioned as an extension of the less complex practices. Project managers should develop a plan that incorporates the actions necessary to achieve these objectives in the project initiation stages and ensure their project sponsors and champions are aligned with the approach.

Project managers charged with large-scale projects such as Six Sigma implementations should be highly skilled as project managers. Currently, those selected to embark on implementation efforts are typically Six Sigma-certified Master Black Belts. These Six Sigma experts are well versed in statistics, Lean tools, root cause analysis, and problem solving. They

may benefit from being trained in project management methods beyond what is currently included in Six Sigma training curriculums. The training modules used in most programs include tools such as project charters, risk analysis templates, and implementation plans, but, since the implementation effort is such a large project, these project managers may benefit from understanding the comprehensive methods of project management explained by the PMI through the Project Management Body of Knowledge.

The literature provided that top-level leaders should require that the system be adopted for mid-level leaders to take ownership of an initiative. The researcher noted this approach was effective with the roll out of TPM and lean. Project managers should ask high-level leaders to execute a specific communication plan that includes requirements for milestones and specific deliverables to be completed by leaders at a specific cadence. As literature suggests, if high-level leaders are not willing to participate in this activity, the project manager should reconsider the pursuit of the project.

Project managers should strive to incorporate Six Sigma into existing programs. Leaders explained they are more apt to support projects if they are not being presented with more to manage. When project managers do well to integrate Six Sigma into the programs and procedures that are already in place, such as product design, quality monitoring, standard creation, and process improvement methods. For example, tools such as process capability, hypothesis testing, and design of experiments can be integrated into existing procedures to launch new products and understand process capability, allowing for data-driven decisions. When introduced in this way, leaders understand the system as a set of tools that should be used to address complex problems rather than another program for them to manage. The researcher noted that employees were using problem solving templates that structured their approach to resolving issues into the DMAIC format. Project managers striving to implement Six Sigma can

build on tools such as this to increase the employees' capability for solving advanced problems. This will help leaders see that Six Sigma is the next step and advanced tool for solving complex challenges instead of a new program to oversee.

Project managers should enlist leaders who are supportive of the program to share successes they have experienced using Six Sigma with other leaders. The leader-to-leader communication may be perceived as more relevant to the leaders receiving the information than if the project manager striving to implement the system attempts to be the sole communicator. Project managers may have opportunities to facilitate best practice sharing for leader groups to help transfer information about the benefits of the system.

Project managers should meet with leaders to explicitly communicate what is needed from them. This communication can be done in various forums and throughout the implementation. When initially introducing the system, project managers may find success garnering support from the leaders through training leaders in Six Sigma awareness. During the training, project managers can explain the expectations they have for the leaders and explicitly state what actions are required of the leaders. During the system deployment, project managers can meet with leaders to discuss the status of projects and explain to the leaders what is needed from them. Once the implementation project is coming to a close, project managers can meet with leaders to explain what actions they own for ongoing system sustainment. Project managers should be considerate of the leaders' time and be concise and direct with their communications.

Project managers should enlist the leaders in project selection and ensure that the projects within the Six Sigma system are linked to KPIs. The leaders should be included in project selection meetings when candidates are preparing to attend training. These meetings should include the selection of the certification project, definition of project scope, and determination of the project team. As part of these meetings, leaders should be made aware of the responsibilities

they hold as project champions or sponsors. The cadence for project updates should be defined during this meeting as well.

Project managers should consider leaders as a customer to their implementation projects. The Six Sigma system is meant to resolve complex issues that the leaders face. The project managers should find out what is important to the leaders and structure their implementation plan accordingly. Through this study, it was evident that project managers emphasized importance on different categories than leaders did for obtaining support from leaders. Project managers put the greatest emphasis on building competencies, demonstrating project success, and integrating Six Sigma into the culture and how work is done, while leaders explained the focus should be on communication, good project management practices, and building competencies in order to garner leader support. Project managers should consider what the leaders value when developing the project implementation plan to ensure emphasis is placed on the proper actions to guarantee adequate support from the leaders for the initiative.

Project managers who are leading system implementations should follow good project management practices. The project scope should be manageable and leaders should be aligned with the scope and objective of the project. The project manager should manage the expectations of the leaders and communicate barriers to the project timely. Project managers must make sure to develop a comprehensive communication plan and deliver communications timely and in an appropriate manner. The project managers have a responsibility to train and develop the project team and to ensure that the stakeholders to the project who need to receive training are trained timely and adequately. As project managers demonstrate their competencies with project management, they will gain the respect of leaders for the implementation effort and system support will be more likely to follow.

Recommendations for Further Study

This study focused on the field of project management, but many of the topics approached principles of leadership behaviors. The responses leaders have to project managers' attempts at engaging leaders and obtaining their support could be explored further to understand what leadership attributes are positively correlated to project success. The scope of this study was restricted to understanding how project managers can garner leader support for implementation efforts. High-level leaders may be benefited by understanding what strengths individuals should possess prior to being placed into roles where they will be expected to champion and support system implementation efforts.

The project managers interviewed have faced challenges with garnering leadership support for Six Sigma implementations. "Challenges I have faced include the following: (a) knowing how to obtain management awareness and establish a good project selection process (b) developing methods to transfer from management awareness, which is good for an initial education of Six Sigma, to more of a management commitment to sustain Six Sigma and make it site owned" (Interview G, para. 7, sentence 2). The project managers agreed good communication with the leaders helps to overcome these challenges, but leaders expressed that they do not feel that they need additional training on Six Sigma. This could be linked to the indication presented by both project managers and leaders that leaders do not care what system is used to solve their problems, and they do not see Six Sigma as an initiative they own. They expect the R&D group to provide resources to solve complex problems, and they only care that their problems are solved quickly and that the solution is sustained. If the system should be owned by Operations, then finding ways to transfer ownership and system understanding could be gaps that may be explored further by additional studies.

Another area that could be further explored would be to understand what elements or methods of project management should be taught to Master Black Belts and Black Belts in the Six Sigma community. The literature suggests Six Sigma is only recently being considered a project management method. Some Six Sigma programs incorporate project management and leadership in their training programs, and some do not. The overall field and practice of Six Sigma may be benefited by a defined training curriculum to ensure those who will be charged with leading Six Sigma projects are well equipped to address conundrums of project management that they may face. The tools provided in project management are valuable for identifying and managing risks, communicating project status, defining implementation plans, understanding the success criteria of project stakeholders, and ensuring high agreement before progressing through project stages.

Reflections

The researcher found the interviews to be enlightening. The discovery of the disconnect between the project managers and leaders regarding their understanding of ownership of the Six Sigma system was one of the learnings for the researcher. Until the two parties agree on system ownership, the sustainment and effectiveness of the system is jeopardized. The program can be successful only to a degree if the R&D team owns the system. The problems being addressed are typically Operations centric. The project managers working within the system can only suggest improvements. The owners of the areas must sustain the improvements and apply the controls prescribed. This disconnect was not clearly evident during the researcher's observations, possibly because of the limited timeframe of the study.

The researcher worked diligently to avoid introducing bias to the study. Observations were recorded exactly as they was witnessed and feedback from interviews was recorded verbatim. The information provided through the interview process was not used in the study

until the interviewees approved the transcripts. Researcher bias was introduced into the study when the interview responses were divided into themes and categories. The researcher worked to use category and theme labels that encapsulated what the interviewees stated, but, through the nature of condensing and consolidating individual thoughts, some of what the interviewees desired to convey may have been slightly compromised. To reduce the risk of losing the thoughts and perceptions provided by the interviewees, the researcher included direct quotes from the interviewees in the presentation of the findings.

The researcher observed that the project managers who felt like their initiatives were valued and supported by the leaders internalized that sense of value as an individual, and those who expressed frustration in garnering leadership support felt as though they were not valued as people by the leaders. Leaders should take caution to understand that when project managers are assigned an initiative, the response leaders have to requests for support can impact the project managers personally. Leaders are called to care for those they lead and should demonstrate an attitude of encouragement. Even when resources are constrained and leaders cannot support initiatives, the message they share with the project manager and project team should express appreciation and importance of the effort to edify and encourage the team. Nehemiah exhibited these attributes and can serve as an example (Nehemiah 4: 14).

Leaders should own the vision of initiatives, just as Nehemiah exhibited (Nehemiah 1-2). They should strive to understand the needs of their reports and the business. As employees drive efforts to achieve the business objective, leaders should break down barriers and provide for them a foundation for success. As leaders provide the vision and empower employees to accomplish the goals, projects and initiatives drafted to achieve the objectives will have the support necessary to achieve a successful end.

Summary and Study Conclusions

Project managers must have support from leaders to effectively implement Six Sigma systems. This study provides definitive steps that project managers can take to obtain support from leaders. The interviews, observations, and review of literature provided information that project managers can consider when developing project implementation and communication plans that may heighten the likelihood of system deployment success. Several themes developed throughout the study. The literature review identified critical success factors for system implementations, but did not provide instructions to guide project managers on how to obtain leadership support for system deployments. The literature review, interview, and observation processes revealed that leadership support is imperative for system implementations, and each interview group provided ideas for how project managers can obtain this support. The major themes amongst each group's feedback and between the two groups' feedback answered the research question by providing that project managers can garner support from leaders through (a) providing timely and thorough communication, (b) demonstrating strong project management capabilities, (c) mitigating the potential negative impacts of turnover of supportive leaders, (d) training leaders on problem solving and Six Sigma, (e) linking projects to KPIs, (f) understanding and planning for the constraints of the organizational structure, (g) using Six Sigma discerningly, (h) pursuing system ambassadors, (i) engaging senior leaders, and (j) developing a plan for system ownership. Practical actions that project managers can take to achieve the support needed from leaders were explained in the presentation of the findings.

A finding unique to this study is that leaders are more likely to support a system deployment when it is integrated into existing processes, procedures, or programs. This study also demonstrated that project managers who have worked to implement a Six Sigma system put emphasis on areas of focus for obtaining leader support that were different than what the leaders

stressed. Project managers should consider this misalignment and structure their deployment and sustainment plans with what the leaders, who are one of the customer groups to their implementation projects, expect and desire to receive from the project managers. The study, as a whole, provides a framework that project managers can follow to obtain or increase the support of leaders for Six Sigma implementations.

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Appendix A: Interview Questions

The interview questions that will be asked of the Six Sigma project managers are as follows:

How long have you been working to support the Six Sigma system implementation?

How have leaders in the company provided support for the system?

What have you done to improve leadership support?

How successful have these efforts been?

What have you done to understand the expectations the leaders have of a problem-solving system?

What have the leaders suggested are important to them in a problem-solving system or effort?

What challenges have you faced in increasing engagement in the system?

What suggestions do you have for improving the likelihood of success for the system deployment and sustainment?

Appendix B: Interview Questions asked of Leaders

The following interview questions asked of leaders will inform this study:

- What is the value of Six Sigma?
- What can project managers do to obtain leadership support?
- What have you instructed your reports about using Six Sigma in efforts to solve problems?
- What requirements should be included in performance objectives for employees related to Six Sigma?
    - How can leaders be influenced to require these objectives of direct reports?
- How would you recommend the benefits of the system be communicated to mid-level leaders?

  What is your comfort level with participating as a sponsor for the Six Sigma program?

  How effective is the demonstrated success of Six Sigma program in helping an organization achieve strategic goals at impacting the buy in leaders have for the system?

  How do you want project managers to communicate progress of projects with you?

  What advice would you give a project manager working to implement a Six Sigma system for garnering support of the mid-level managers?

Appendix C: North America Six Sigma Program Stats

North America Six Sigma Program Stats

Training			Function					Certification Level			Certification Rate		
Segment	YB/GB Trained	BB Trained	R&D	Operations	Supply Chain	Engineering	Other	BB	GB	YB	BB	GB	YB
1	231	15	107	113	7	1	5	9	80	142	60.0%	34.6%	61.5%
2	51	0	19	13	6	12	1	0	5	46	0.0%	9.8%	90.2%
3	5	0	3	1	1	0	0	0	1	4	0.0%	20.0%	80.0%
4	9	0	8	0	0	0	1	0	0	9	0.0%	0.0%	0.0%
5	2	1	2	0	0	0	0	0	1	1	0.0%	50.0%	0.0%
6	2	0	2	0	0	0	0	0	0	2	0.0%	0.0%	0.0%
7	3	0	0	0	0	0	3	0	2	1	0.0%	66.7%	0.0%
	303	16	141	127	14	13	10	9	89	205	56.3%	29.4%	67.7%

Level	Training	Experience	Training Others	Certification
Black Belt	· 10 days external training · Advanced tools DOE Regression · Mentoring and Project Management skills	· Strong Certified Green Belt · Analytical competence	· Mentor GB at basic level	· Attend all 10 days of training. · Take exam · Complete a project · Complete a DOE
Green Belt	· 10 days internal classroom training with project · Six Sigma theory, use of tools, understanding Minitab®	· Associates with Process Improvement and/or Problem solving within their job description · Analytical competence	· Help project team understand the basics of using the Six Sigma Methodology in Process Improvement and Problem Solving	· Attend all 10 days of training · Take Exam · Complete Project to include presentation to Management.
White Belt	· ½ day internal training · Six Sigma Theory, Project selection, Roles in Six Sigma	· Site Staff and Upper Management	· NA	· Attend training
Champion Training	· 2 Hour introduction to Six Sigma Methodology. · Project Selection, Roles in Six Sigma	· Site Staff	· NA	· Attend training
Yellow Belt	· 1 day internal training. · Data collection, simple charts and graphs · Statistical Process Control (Control Charts)	· Floor Associates	· NA	· Attend training

Appendix D: Interview Identifiers

Interview Identifiers	
Leader Interviews	Project Manager Interviews
B	A
D	C
F	E
I	G
J	H
L	K