EMOTIONAL INTELLIGENCE TRAITS OF PROJECT MANAGERS AND COMPLEX INFORMATION TECHNOLOGY PROJECT OUTCOMES

by

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Abstract

This study looked at the soft skills of project managers who lead complex projects as measured by the Trait Emotional Intelligence Questionnaire – Short Form (TEIQue-SF) to determine if a link existed between EI and project success. The 7-point Likert-Type survey consisted of 30 questions that appraised a manager's EI factors comprising of self-control, well-being, emotionality, sociability, and a global EI score. The survey was distributed by SurveyMonkey® Audience throughout the United States to certified professional project managers; 241 responded, and 100 met the requirements of the study. Project success was measured by three questions of whether the project met the triple constraints of budget, schedule, and scope, along with if the project was considered successful by the project manager and also whether the customer considered the project successful. The results showed no statistical correlation between complex IT project outcomes and the trait EI of project managers. It is recommended that future studies of this nature assess the problem from a holistic perspective, perhaps using large datasets and big data reduction tools to reveal hidden connections. Past and present researchers have indicated a weak to no relationships in a strictly linear sense between EI and IT project outcomes, which suggests that this phenomenon demands a more complex, layered, and in-depth examination.

Dedication

To my late parents, who showed unconditional love and encouragement in whatever endeavor I undertook. To my children, Jenniffer, Sarah, Curtis, and Nicole, whom I love dearly and who inspire my best version.

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CHAPTER 1. INTRODUCTION

Introduction

Complex information technology (IT) projects have a low success rate as measured by meeting their initial goals (Baghizadeh, Cecez-Kecmanovic, & Schlagwein, 2020). Many factors contribute to failed projects. However, a significant reason for the unsuccessful completion rate of IT projects might relate to the project managers' (PM)s' leadership skills and talents (da Silva, Jerónimo, & Vieira, 2019; Pollack & Adler, 2016). Some researchers suggested that the emotional intelligence (EI) traits of a PM are necessary to determine the outcome of a project (Lowe, 2019; Neil, Wagstaff, Weller, & Lewis, 2016; Rezvani et al., 2016). Zhan and Fan (2013) identified EI as a possible indicator of job performance for project managers (PMs). Complex projects need a PM who has the following social traits: emotional resilience, influencing, intuitiveness, self-awareness, sensitivity, and effective communication skills (Hendon, Powell, & Wimmer, 2017). Finding in advance if a PM possesses these social traits may be valuable to predict complex project outcomes. Measuring EI provides insight into whether or not a PM possesses these social traits (Gunter, 2020; Maqbool, Sudong, Manzoor, & Rashid, 2017).

The extent of a relationship between the EI traits of PMs and the outcome of complex information technology projects is not known. Project failures are likely born of a lack of leadership skills rather than technical project management competencies (da Silva et al., 2019). Projects need PMs with strong leadership skills that include EI abilities. Learning in advance or developing the EI traits of PMs may help predict complex project outcomes (Thomas, 2017). The basis of this research examined if there are individual relationships to improve project success attributable to a PM's trait EI. The focus of this study examined the four Trait EI

measurements, which include sociability, self-control, well-being, emotionality, and a global EI trait score (Petrides & Mavroveli, 2018).

This study's focus examined the relationship between project leaders' self-reported EI scores and IT project outcomes. PMs' leadership qualities with strong social skills have led to successful project outcomes (Fayaz, Kamal, Amin, & Khan, 2017). PMs with highly developed social skills have proved instrumental in successfully leading project teams (Bredillet, Tywoniak, & Dwivedula, 2015; Silvius, 2016). IT Projects are an essential driver in businesses for achieving strategic organizational goals and creating value. Successful IT projects support positive financial performance for organizations, while, conversely, poor outcomes have caused significant economic and productivity losses (Pollack & Adler, 2016). Standish Group (2015) CHAOS report noted that organizational leaders face substantial financial losses due to poor project outcomes. The Standish Group estimated that less than 30% of IT projects are successful.

Chapter 1 includes background information regarding the importance of EI as a tool for predicting project outcomes. The study's purpose, research questions, and rationale may provide added insights into the business problem. The context for the foundation of the research is provided by the theoretical framework and methodology. The significance of the study includes information on how the study extends the body of knowledge on the relationship between EI and PMs toward positive project outcomes. Included in Chapter 1 are operational definitions, assumptions, limitations, and delimitations of the research. Chapter 1 ends with a summary of the organization of the rest of the study.

Background of the Study

With evolving technology, large IT projects employ more sophisticated software systems, hardware componentry, and architectural designs. The costs of developing and implementing these systems can be substantial (Trejo, 2016). Complex IT projects have become increasingly important for organizations globally in achieving their strategic objectives (Davis, 2011). IT capital expenditures were a significant factor in increasing firm market valuation and realizing competitive advantages (Barrett, Oborn, & Orlikowski, 2016). Hendon et al. (2017) found that a high number of IT PMs lacked high EI that translated into low interpersonal and communication aptitude that may have prevented PMs from achieving successful projects. EI skills, if lacking, may be taught and developed.

The project management discipline has grown in stature and acceptance as a significant contributor to organizational success. PMs with strong social and people skills appear to contribute to leading project teams toward success (Bredillet et al., 2015). A primary component in strong people skills includes displaying mature EI competencies under stress and uncertainty (Maqbool et al., 2017). Such competencies may consist of strong team-building skills, an ability to be creative and innovative, and a strong sense of compassion. As organizations grow, a need for more individual social skills gains' importance in a complex team environment (Cascio & Montealegre, 2016). The examination of PMs' interpersonal and intrapersonal skills as a significant factor for project improvement has increased. EI is a construct that has linked emotionally intelligent leaders with superior organizational outcomes (Petrovici & Dobrescu, 2014; Walter, Humphrey, & Cole, 2012).

Business Problem

IT project failure is costly in terms of loss of revenue and detrimental to the reputation of an organization. An estimated $1 trillion is spent on IT projects annually in the United States (U.S.), and only 29% of the projects are considered as successful, costing organizations over $170 billion in loss profitability (Krasner, 2018). A concurrent need exists to fully understand how the EI of a PM is related to achieving a successful project outcome. The general business problem is that the failure of IT projects is increasing and thus contributing to decreased organizational profitability (Baghizadeh et al., 2020). The specific business problem is a lack of knowledge relating to the relationship between the EI traits displayed by PMs in the U.S. and the successful outcomes of the IT projects PMs manage.

Research Purpose

The purpose of this quantitative correlational study was to examine if a relationship existed between certified IT PM traits of self-control, well-being, emotionality, and sociability, and IT project outcomes. The project success outcomes are defined as project scope, schedule, and budget served as the dependent variable. The EI traits PM include self-control, well-being, emotionality, and sociability were the independent variables. Success was determined by the PM and the customer. Data from this study might result in reducing project failure rate and revenue losses. My specialization is leadership.

The project outcome included three questions: The PMs self-assessed project success, whether the project met the triple constraints of scope, budget, and schedule, and whether the customer thought the project was successful. Mir and Pinnington (2014) developed project success questions that formed the basis of those asked herein. A demographic survey identified and qualified PMs that completed complex IT projects. The requirements for complex IT

projects included the following: Project duration of a minimum of 3 months or more than $100,000, the project team of at least three members along with at least two project stakeholders impacted, internally or externally of the organization.

Previous researchers have used descriptive quantitative research design to examine the relationship between EI and IT project success (Tessema, 2010; Trejo, 2016). A quantitative correlational design was appropriate for this study and conformed to the participants investigated (Hackett, 2019). The present study's results added to the body of literature in the fields of business administration and leadership practice by helping better understand the connections between the dependent variable and independent variables under study here.

Research Questions

The focus of this quantitative correlational research examined if there was a relationship between the EI traits displayed by IT PMs in the U.S. and the success of the IT projects they managed. The following research questions are followed by the hypothesis:

RQ1. To what extent, if any, does a significant relationship exist between PMs' sociability scores and the outcome of IT projects?

H_o1: There is no statistically significant relationship between the PM's sociability score and IT project outcomes.

H_a1: There is a statistically significant relationship between a PM's sociability score and the IT project outcomes.

RQ2. To what extent, if any, does a significant relationship exist between PMs' self-control scores and the outcome of IT projects?

H_o2: There is no statistically significant relationship between the PM's self-control score and IT project outcomes.

H_a2: There is a statistically significant relationship between a PM's self-control score and the IT project outcomes

RQ3. To what extent, if any, does a significant relationship exist between PMs' emotionality scores and the outcome of IT projects?

H_o3: There is no statistically significant relationship between the PM's emotionality score and IT project outcomes.

H_a3: There is a statistically significant relationship between a PM's emotionality score and the IT project outcomes.

RQ4. To what extent, if any, does a significant relationship exist between PMs' well-being scores and the outcome of IT projects?

H_o4: There is no statistically significant relationship between the PM's well-being score and IT project outcomes.

H_a4: There is a statistically significant relationship between a PM's well-being score and the IT project outcomes.

RQ5. To what extent, if any, does a significant relationship exist between global EI trait scores of PMs and IT projects' outcomes?

H_o5: There is no statistically significant relationship between the PM's global EI trait score and IT project outcomes.

H_a5: There is a statistically significant relationship between a PM's global EI trait score and the IT project outcomes.

Rationale

Studies on the relationship between EI traits and effective leaders were ample (Prezerakos, 2018). Numerous studies created a compelling case that a link existed between EI

with effective leadership and managerial performance (Lubbadeh, 2020). A relationship existed between EI, team performance, group cohesiveness, and positive conflict management skills (Al-Hamdan, Adnan Al-Ta'amneh, Rayan, & Bawadi, 2018; Rezvani, Khosravi, & Ashkanasy, 2018). These links showed promising findings that PMs with high EI traits led and delivered complex IT projects successfully.

Scanning the literature for works that connected EI traits to a successful project yielded scant results. This study on EI and complex IT project outcomes may build on the research and expand the findings to different industries, geographies, and cultures (Nguyen, 2015; Tessema, 2010; Trejo, 2016). Nguyen (2015) focused on a regional medical center in Texas, while Tessema (2010) centered on government employees in Washington, D.C. Trejo (2016) focused on Hispanic PMs. The three preceding studies dealt with EI competencies' relationship to IT project success, showing some positive relationships. Thomas (2017), who utilized the same instrument as this study, found that in construction project management, there was a significant correlation to EI traits and project success. This dissertation built on Nguyen (2015), Tessema (2010), Thomas (2017), and Trejo (2016) by expanding the research into the IT industry represented across the U.S. and found no statistically significant relationship between EI traits and complex IT project success.

Theoretical Framework

This study was grounded using the trait-based framework of EI as the theoretical framework. The trait-based framework developed by Petrides and Furnham (2001) showed an alternative view of traditional intelligence that helped explain leaders' success. Four fundamental factors consisted of self-control, well-being, emotionality, and sociability with 13 sub-facets that constitute EI theory's trait-based framework (see Table 1). The primary

proposition of trait EI theory was that of construct personality traits as opposed to abilities (Petrides & Mavroveli, 2018). Siegling, Nielsen, and Petrides (2014) identified Trait Emotional Intelligence (TEI) as a predictor of individual success. EI theory's trait model was used as the predictor variables, measured by the TEI Questionnaire Short Form (TEIQue-SF), to predict project success.

Table 1

Factors and Facets of Trait Emotional Intelligence

Factors	Facets
Self-control	Emotion control
	Impulse control
	Stress management
Well-being	Trait optimism
	Trait happiness
	Self-esteem
Emotionality	Trait empathy
	Emotion perception (self and others)
	Emotion expression
	Relationships
Sociability	Emotion management (others)
	Assertiveness
	Social Awareness

Note. Adapted from "Developments in trait emotional intelligence research," by K. V. Petrides, M. Mikolajczak, S. Mavroveli, M. Sanchez-Ruiz, A. Furnham, & J. Pérez-González, 2016. *Emotion Review*, *8*, 335-341, p.336. doi:10.1177/1754073916650493. Copyright 2016 by SAGE Publications.

EI emerged into the literature in the 1990s when Salovey and Mayer (1990) presented their seminal framework for EI. Other researchers created models of EI as a distinct learned intelligence skill rather than just a personality trait (Bar-On, 2006; Goleman, 1995). Some promising research appeared to establish a positive relationship between EI and effective leadership (Hicks & Dess, 2008). Following the research on the positive results of EI and leadership, studies began to expand into other areas, such as limited research showing a positive connection between EI in PMs and project outcomes (Nguyen, 2015; Tessema, 2010; Trejo, 2016).

A broad definition of leadership is the ability to attain specified results through interpersonal influence and a communication process (Rosari, 2019). Proponents of various leadership theories, such as trait, contingency, and behavioral stated their effectiveness; the universal qualities included these competencies; intellectual (IQ), managerial (MQ), and emotional (EQ). Profiles of competent managers in complex IT projects included strong critical analytical skills (IQ), managing resources (MQ), high self-awareness, interpersonal sensitivity, and intuitiveness (EI) (Shao, 2018).

Thorndike (1920) introduced the concept of social intelligence that had similarities to the EI construct. Thorndike defined social intelligence as the ability to understand others' emotions and choose an appropriate behavior to suit the environment. Thorndike's work did not receive much traction in the scientific community until the subject resurfaced prominently in the 1990s when several EI models emerged as separate from social skills (though some overlap may exist) and thinking or cognitive intelligence (IQ). The differing models (see Figure 1) included the three prominent models, the ability model suggested by Salovey and Mayer (1990), the mixed

models advanced by Bar-On (2004) and Goleman (1995), and the trait model developed by Petrides and Furnham (2001).

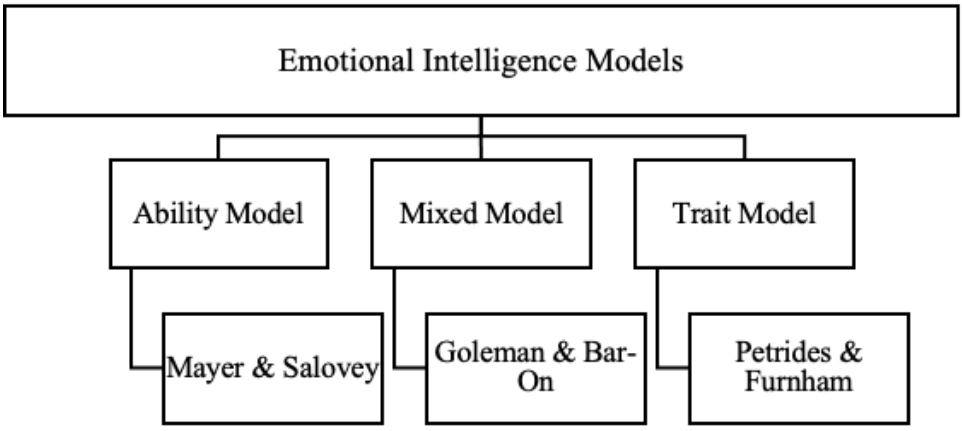

Figure 1. Emotional intelligence models by function.

A broad definition of EI theory, as defined by Goleman (2001), was the ability to recognize and regulate one's emotions and that of others. The ability model described EI in four distinct ability areas: The ability to be aware of one's feelings, the ability to control one's emotions, the ability to empathize with other's emotions, and the ability to manage others' emotions in a social context (Salovey & Mayer, 1990). The mixed model combined non-cognitive and competency factors (Bar-On, 2004; Goleman, 1995). A combined theoretical definition of EI was the ability to perceive accurately, appraise, and express emotion; the ability to access and generate feelings that facilitate thought; the ability to understand emotion and emotional knowledge; and the ability to regulate emotions to promote emotional and intellectual growth (Goleman, 1995; Mayer & Salovey, 1997). While Bar-On stated that some abilities were purely intellectual like technical expertise, other abilities combined thought and emotions, forming EI. In the mixed model, non-cognitive skills equated to cognitive skills in managing and

understanding emotions toward optimum workplace performance (Goleman, 2001). Table 2 shows the Bar-On Mixed EI model with the five major components and the 15 sub-categories.

Table 2

Components of EI (Five Composite Scale Scores) from Bar-On EQ-I Instrument

Intrapersonal	Interpersonal	Adaptability	General Mood	Stress Mgmt
self-regard	empathy	reality testing	optimism	stress tolerance
emotional self-awareness	social responsibility	flexibility		impulse control
assertiveness	interpersonal relationships	solving		
independence				
self-actualization				

Note. Adapted from "Bar-On Emotional Intelligence Quotient Inventory (EQ-i) Technical Manual*,"* by R. Bar-On, 2004, p. 3. Copyright 2004 by Multi-Health System, Toronto, Ontario.

The differing models within the EI theoretical framework of Trait EI, Ability EI, and Mixed Model is the method of measurement rather than any distinct theoretical divergence. The measurements diverge by a performance-based measurement or a self-perceived self-report as appropriate (Petrides & Furnham, 2001). Trait EI is a collection of emotion-related self-perceptions best assessed through self-report questionnaires as the Petrides and Furnham (2001) TEIQue instrument measures. Ability and mixed models are measured through a performance-based self-report such as the Bar-On (2004) Emotional Quotient Inventory (EQ-i).

Significance

As developing technical skills of PMs has continued to increase from the 1990s to the present with various types of software developing life cycles (SDLC) with different models and methods, little progress was expected to improve IT project success. Project management models such as waterfall, V-shaped, evolutionary prototyping, spiral method, iterative and

incremental method, and agile development peaked with slight measurable improvement on project outcomes; therefore, focusing more on the soft skills of PMs may add promising improvements to IT PM's successful outcomes (Ajam, 2017; Dean & East, 2019). Researchers have shown that successful project management had a significant positive impact on organizational profits and sales (Pollack & Adler, 2016). The economic implications of project failures resulted in substantial organizational losses affecting corporate productivity and sustainability. IT project success in varying industries was examined to influence the economic success (Krasner, 2018).

The significance of this study is to help organizational leaders identify critical competencies that may assist IT PMs in improving project outcomes. The focus of the study was to identify EI components that most relate to successful project outcomes. Through testing and training IT PMs, EI skills may be a significant contributor to identifying and promoting competencies that improve project outcomes. Studies have shown that training develops EI competencies (Bar-On, 2006; Goleman, 1995). Data from this study may contribute new insights to fill a gap in the literature by examining if a relationship exists between complex IT PMs' EI and project outcomes. As a result, this study may add justification for organizational leaders to develop training programs to improve EI competencies and improve PMs' hiring practices by testing for high trait EI. The study may also discuss other areas of consequence that affect project outcomes.

Definition of Terms

***Emotional intelligence* (EI).** EI is the ability to correctly interpret, assess and communicate emotions; the ability to access and produce emotions that facilitate thinking; the ability to recognize emotions and emotional knowledge; and the ability to control emotions to

foster emotional and intellectual development (Gómez-Leal, Gutiérrez-Cobo, Cabello, Megías, & Fernández-Berrocal, 2018).

Emotionality. Emotionality is an EI trait factor consisting of emotional perception, trait empathy, emotional expression, and relationships (Petrides et al., 2016).

Project management. Project management is "the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements" (Project Management Institute [PMI], 2017a, p. 10). For IT project management, the outcome is usually a technical solution, a product, or a service to address some given business objectives.

Sociability. Sociability is a factor of EI that consists of assertiveness, control of emotions, and social awareness. (Petrides et al., 2016).

Trait emotional intelligence. "Trait emotional intelligence (TEI) concerns our perceptions of our emotional abilities, that is, how good we believe we are in terms of understanding, regulating, and expressing emotions in order to adapt to our environment and maintain well-being" (Petrides et al., 2016, p. 335).

Well-being. Well-being is an EI trait factor that consists of self-esteem, happiness, and optimism (Andrei, Smith, Surcinelli, Baldaro, & Saklofske, 2016).

Assumptions, Limitations, and Delimitations

According to Andersen and Hanstad (2013), assumptions are likely true under appropriate conditions. The following assumptions formed the basis of the study. The first assumption was that the IT projects provided the necessary complexity in scope and diversity to measure PMs' EI in leadership positions adequately. The second assumption was that IT projects that met their full operational capability within 2 years of the initial forecast were considered successful. It was assumed that projects that did not meet their full operational capability within

2 years were unsuccessful. Another assumption was that the population sample accurately represented the intended population of professional PMs completing IT projects. The sample was U.S. information technology PMs who volunteer and are certified as PMs and meet the study's requirements as defined by complex projects.

Limitations are self-reported weaknesses of a study that provides context to the scope and lend credibility to the author (Theofanidis & Fountouki, 2018). Disclosing limitations and describing their impact on the study leads to the formation of recommendations for future research (Brutus, Aguinis, & Wassmer, 2013). The primary limitation of this study was reliance on self-reported data regarding EI and project success. Other limitations included sample size and longitudinal effects related to the timeframe for study completion. Some scholars question the validity of data collected through online self-reported surveys for reasons such as social desirability, individuals desiring to enhance their well-being measures (Caputo, 2017). Mitigation for this phenomenon included limiting participants through filtering and selection criteria.

Delimitations help a researcher bound scope and result from the researcher's decisions (Theofanidis & Fountouki, 2018). Applying a quantitative correlational method was one delimitation for the study. Limiting the predictor variable to TEI's factors as opposed to a more comprehensive study that investigates general EI and ability EI provided bounding for the scope of the study. A delaminating factor was that all PMs in the study were active employees of information technology firms or part of their firms' information technology department. Full-time PMs were recruited from firms in the U.S. taken from the SurveyMonkey® Audience database as confirmed information technology certified PMs.

Organization of the Remainder of the Study

This dissertation contains five chapters, plus references and appendices. Chapter 1 included the topic under investigation, presenting research questions and hypotheses that guided the study. Chapter 2 provides a review of the literature regarding three distinct areas of study that intersect at various points. Leadership, project management, and EI theories add to the complexities and challenges in improving project management outcomes. Peer-reviewed data about EI and gaps for further research are mentioned. Chapter 3 details the methodology, procedures, and instrument used to measure and analyze the data. Chapter 4 describes the results. Chapter 5 addresses the findings, implications, and conclusions, along with recommendations for future studies.

CHAPTER 2. LITERATURE REVIEW

Introduction

This quantitative correlative research study aimed to examine the relationship between EI traits of IT PMs in the U.S. and successful completion rates of PMs' IT projects. The participants of this study were PMs who were team leaders and managers of complex IT projects. The Literature Review chapter addresses theories surrounding this study, project management, complex IT management issues, leadership theories, and EI models' development as a factor in improving project outcomes. The research question that guided the proposed study was to what extent, if any, was there a relationship between EI scores of PMs and the outcome of projects? The organization of Chapter 2 includes leadership theories, project management theories, and link EI to leadership theories, performance, and IT project management outcomes (see Figure 2). Studies on the relationship of EI skills and effective leaders are numerous (Casbarro, 2019). Research connecting EI skills to successful project outcomes is limited (Nguyen, 2015; Tessema, 2010; Trejo, 2016). This study regarding EI and complex IT project outcomes was built on the limited available research and expanded the study to varying demographics and industries.

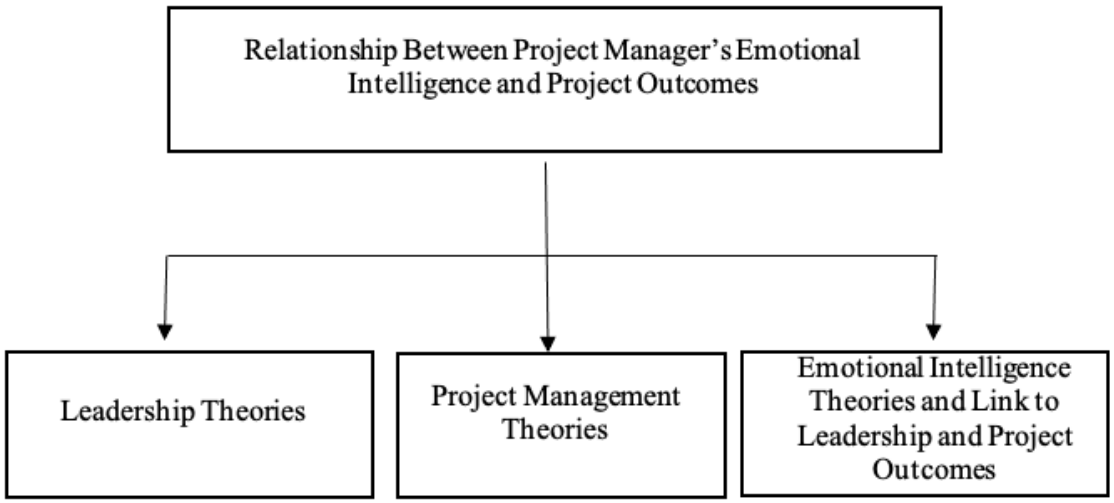

Figure 2. The literature review theoretical framework.

Documentation

The strategy used to identify literature applicable to the proposed study included using the electronic databases, including Google Scholar, and the Project Management Institute (PMI) online library accessible to PMI members. The search focused on scholarly articles from peer-reviewed journals and business doctoral dissertations. Journals searched included business management, IT management, psychology, organizational behavior, leadership, and project management. Relevant terms used in the searches included EI, project management, information technology project management, and the relationship between IT projects and EI.

Leadership Theories

PMs are team leaders and managers. Leadership is a fundamental element of managing projects. A discussion of leadership theories and positive leadership skills is vital in understanding qualities that make for successful project outcomes. Leadership theories, whether based on individual traits, organizational structures, complexity, or systems theories, agree on the merits of social, emotional, interactive, and collaborative skills for leadership effectiveness.

Leadership effectiveness may be viewed from many perspectives, although an accepted definition is to what extent the leader's behavior and decisions successfully achieve an organization's goals (Casbarro, 2019).

Leadership is a social construct that requires interaction with others. Communication is the primary form of interaction. How well one connects and communicates with others may spell the difference between failure or success in achieving successful organizational outcomes (Jensen, Moynihan, & Salomonsen, 2018). Since the 1900s, these leadership theories in chronological order dominated research: The great man, trait, behavioral, contingency, transactional, and transformational theories. The theories initially focused on individual traits and gradually expanded on situations, context, behaviors, followers, and complexity, while the emphasis remained on individual leader traits.

Toward the end of the 20th century, more attention was given to followers, situational, and contextual interaction as essential factors to leadership success (Lowe & Gardner, 2000). A paradigmatic shift in thinking and leadership development approaches took place at the beginning of the 21st century. A more inclusive, interactive, multifaceted, adaptive, collaborative, and relational approach to leadership development theories had evolved. The paradigm shift in leadership development had moved from personal power, control, and be served to empower others, model, and serve others. Leadership theory has evolved from a mechanistic directive perspective to an organic, relational, learning, and innovative approach. Newer theories advocated constant dialogue, created trust, bridged boundaries, and co-created excellence and innovation (Kailola, 2020).

From 1900 to 1930, leadership definitions focused on the mechanist view of control and centralization of power (Rost, 1991). In the 1930s, trait and group process theories emerged.

Through the 1940s and 1950s, a group process theory approach of leadership dominated the literature with scholars defining leadership as a relationship that developed shared goals. The 1960s literature focused on viewing leadership as behavior that influenced others toward shared goals. During the 1970s, leadership theory shifted from a group approach to management's organizational behavior approach and was touted by scholars into the 1980s. In the 1980s, an explosion of books on leadership mainly focused on theories of excellence that mimicked the Great Man Theory. Rost (1991) advanced the notion that there was no clear, coherent definition of leadership in 1990 and that scholars and leading practitioners were no surer of what leadership was in 1990 than in 1930.

Transactional and transformational leadership theories began in the 1970s and remained widely discussed in the literature into the 2020s. Burns (1978) described transactional leadership as one who contacted another to exchange value, while transformational leadership occurs when the leader and follower rose one another to higher motivation and morality levels. Most of the literature about leadership in the early 2000s has focused on transformational leadership as the most effective in accomplishing desired goals. Many features of transformational leadership concepts are closely aligned with EI attributes such as strong interpersonal and intrapersonal social skills, also the ability for empathy, emotion control, effective communication, and stress management.

Developments in Leadership Theories

Relational, complexity, and systems leadership theories shared many similarities and insights with the leadership skills needed in a complex IT project management environment. Proponents of relational leadership theory, Nicholson and Kurucz (2019), took a position that leadership came from daily relational dialogue. Relational leadership held oneself in constant

relationship with others and ethically responsible to others. From a relational perspective of leadership, leaders did not see others as objects to be influenced but as equal individuals in a relationship to themselves. Included is the ability through constructive dialogue to work out differences between one another. As proposed by Uhl-Bien, Marion, and McKelvey (2007), complexity theory viewed leadership as a network of individuals bonded in a cooperative, interactive effort by a common goal. Adaptive leadership with the ability to produce positive outcomes with a dynamic, interactive dialogue that fostered creativity and learning throughout an organizational structure and outside of the organization describes complexity theory.

Systems and Complexity Theories

Ackoff (1994) defined a system consisting of two or more parts that affected each other and the whole without being divided into independent parts. Ackoff described three types of systems, mechanical, organismic, and social. Traditional systems such as mechanistic required a degree of control by managers that a social system thinking model disrupts (Moon, Choi, & Armstrong, 2018). Mechanistic management attempted to gain efficiency and productivity by looking at an organization's individuals as parts of a machine. Through training and experience, the individuals were no more than passive parts of a whole toward a specified end that eventually led to a dysfunctional bureaucratic organization. Organic organizational systems where individual thinking strives for growth as a requirement for the survival of the whole, allowing a degree of individual freedom to attain specified goals without any purpose for the individual and potentially depriving individuals of personal development (Kessler, Nixon, & Nord, 2017).

Social system management did not analyze or control. Instead, social system management focused on the individuals' social interaction and how it affected each other and the whole and how the whole was affected by separate interactions. The social process was more of

a synthesis that looked at the broader picture. At the same time, traditional management used analyses to break down a structure into the smallest components to understand, attain, and control desired results (Caulfield, & Brenner, 2019). Ackoff (1994) described systems management as dissolving problems rather than solving them. A systems approach was a collaborative effort looked at from differing perspectives at improving the system that potentially created problems. A systems approach to leadership aimed to dissolve potential problems before issues arose in contrast to traditional management that solved existing problems.

Moliterno and Mahony (2011) postulated that organizations were made up of multiple layers of networks that influenced each other, thereby forming a social system multi-layered network theory. Networks interacted with each other and included hierarchical interaction across, up, and down. Moliterno and Mahony further posited that recognizing organizational networks as a system of hierarchically nested networks allowed leaders to employ tools and concepts of multilevel theory to study how those networks related to one another. Moliterno and Mahony pointed out that network structures at varying levels often blocked collaboration or knowledge sharing.

Smith and Lewis (2011) discussed contradictory theories regarding organizing, such as collaboration versus control, individual versus the collective, and flexibility versus efficiency. How leaders responded to these paradoxes may have determined success in a global, complex, dynamic, and competitive environment. Vicious cycles that had adverse outcomes came from a need for consistency, defensiveness, and emotional anxiety. Virtuous cycles were encouraged by acceptance and resolution strategies. Smith and Lewis, proponents of the dynamic equilibrium model, stated that successful leadership fostered acceptance and resolution in seemingly paradoxical situations. Acceptance eased different tensions toward the ability to resolve divisive

opposing choices. Virtuous cycles, reiterating between splitting and integration, proposed that this virtuous cycle enabled sustainability by fostering creativity and learning, allowing flexibility and resilience.

Carlisle and McMillan (2019) noted that complexity theory was incompatible with the idea of controlling the balance between incremental innovation and radical innovation. Complex adaptive systems (CAS) posited that environmental circumstances determined organizational leadership and self-organized and responded as required. A CAS framework did not distinguish between long-term and short-term goals but responded with flexibility as needed to their environment. Traditional hierarchical or mechanistic systems attempted to control outcomes. In contrast, CAS theory maintained fluid and interdependent interactions that resulted in self-organizing and adapting organizations that best operated close to the edge of chaos. While allowing flexibility, management needs to understand where different areas were operating close to emergent complexity while avoiding any extreme adverse outcome by providing a framework for accountability, responsibility, and decision-making. While not easy, the goal was to have a dynamic mix of stability and a stretch close to chaos that created a sustainable, innovative advantage.

Glor (2007) looked at organizational changes as a self-organizing process by focusing on the individual, social dynamics, and implementation challenges. Glor explored the ability of adaption through organizational patterns. Complexity theory, first developed through other disciplines, acknowledged that complex systems be studied as whole entities, systems, and behavior patterns could not be reduced to essential elements. Proponents of complexity theory believed that the interactions of the parts in varying ways, in turn, exhibited spontaneous self-organizing or formed patterns that adapted to their environment. The study of organizations

emerged from those studies in areas such as physics and biology. As in other disciplines, those phenomena were observed by researchers in areas such as innovation in organizations. Systems theories have added to complexity theory in feedback and reinforcing loops.

To traditional top-down management practices of leaders, the idea of lack of control in a complex self-organizing theory perspective offered challenging thinking shifts to their traditional methods. The perceived lack of authority on a leader's part of initiating, implementing, and managing change was a challenge to their conventional strategic approach. Glor (2007) noted that real change and innovation came from organization patterns (or context) implemented. Rogers, Medina, Rivera, and Wiley (2005) posited that organizations that had variety, reactivity, and ability to self-organize develop emergence and adapt. Variety took place in an organization open to diverse opinions, encouraged new ideas, and facilitated dialogue inside and outside the organization. Variety came from the diversity of various ethnic outlooks, varying professional backgrounds, and across gender. Influential factors in change management were intrinsically motivated individuals in a non-hierarchal culture, and challenges are minor. Traditional hierarchal structured organizations were more likely to create barriers to change and innovation. Emergence and innovation worked best in a decentralized organization, bottom-up culture allowing numerous ideas, and encouraged intrinsically motivated employees to excel. Alaa (2009) speculated that leaders needed to facilitate factors such as constant dialogue, team building, developing trust, and cooperative interaction, either formal or informal internal and external to the organization. The most prominent leadership challenge appeared to be a continual balancing toward stability, goals, and focus while avoiding anarchy in facilitating an open culture that generated spontaneous sustainable emergence.

Richardson and Lissack (2001) discussed natural or organizational boundaries from a complex systems perspective. In a complex system view, Richardson and Lissack stated that boundaries, whether physical or mental constructs were natural. In organizational literature, the term *boundaryless* organization was often used as less division between hierarchal levels, functions, departments, or customers (p. 34). From a complex theory perspective, the constant interaction of the parts, a constant self-organizing takes place, an evolutionary process that made up the whole, and the whole was a new structure from the interacting parts. The boundaries were emergent and temporary. At the same time, challenging, if not impossible, to define boundaries, little doubt remained that there was a constant interaction between individuals, organizations, cultures, areas of expertise, and interrelated responsibilities in practice. The most significant challenge to traditionalist managers was evolving from a single universal knowledge base and becoming open to dialogue from differing and emerging perspectives.

Gadman and Cooper (2005) suggested that from a leadership perspective, a critical aspect is the alignment of collaboration internally and externally toward a competitive organizational strategy. An example is an organization aligning partnerships throughout the supply chain towards value-add to their customers that support financial objectives. In high complexity situations and the need for knowledge creation, partnering outside the organization may be essential to sustaining a competitive edge. Traditional leadership may become a barrier to customer sophistication and quickly changing demands requiring organizations to adapt to new and innovative approaches to management that is more open and collaborative.

Ford (2006), when discussing a postmodern leadership standpoint, mentioned open-processional leadership that was a reciprocal-relational shared control with all participants. Ford's view of co-created organizational change required three fundamental principles to be

applied. Ford included these leadership elements as necessary in a co-created organization, in equal proportion opportunities for open, communicative interaction, safeguarding the process, and allowing the expression of repressed views.

Most leadership theorists agreed that effective communication was essential to successful leadership. Hills (2013) suggested some requirements that supported effective relational, interactive communication such as time for dialogue, active listening, and clarity. Sodeke, Turner, and Tarver (2010) provided suggestions for a suitable communication environment that provided for transparency, respect, humility, and trust. Turner et al. also mentioned unbiased fairness, civility, and humor to promote positive relationships. Pearce and Pearce (2000) discussed desired communication as a process of dialogic virtuosity. Dialogic virtuosity is the art of excelling at dialogue to achieve a closed-loop that results in a positive, productive, and useful outcome. Some characteristics of this type of dialogue included speaking so others will listen, listen so others will speak, and the ability to hold one's perspective while allowing others to hold differing viewpoints. An essential ingredient in leading effectively required a degree of personal, collaborative leadership skills cocreation.

Leadership Cocreation

Scholarly literature offered different theories on leadership cocreation. Some theorists emphasized self-reflection, while others experience or social interaction (Roberts, Dutton, Spreitzer, Heaphy, & Quinn, 2005). Peer-reviewed literature on leadership cocreation agreed that some form of one or a combination of personal experience, interaction, reflection, and feedback played a part in a leader's development and self-portrait. The following are some fundamental theorist approaches to leadership cocreation and the application of personal leadership development and awareness.

Bandura (1977) developed a self-efficacy theory that personal efficacy comes from four principal sources: personal accomplishments, modeling others, persuasive input, and emotional state. For example, in the emotional state, Bandura stated that high arousal in a stressful situation might provide a revealing assessment regarding personal competency. The highly charged emotional state may impede sound judgment, thereby creating a sense of inability of an individual to handle threatening situations competently.

A more positive reflected best self (RBS) theory postulated individuals defined themselves on how the individual interpreted experience, through social interaction, and the individual's perception of how others view them (Roberts et al., 2005). RBS theory indicated the changing self-knowledge at one's best. The transformation may be gradual or, through moments of personal achievements were the feeling of aliveness in pursuit of our full potential to help create our self-portrait. The positive feedback from others, along with positive experiences over time, adds to a self-portrait that translates extraordinary possibilities into reality.

The social constructionist basic theory was that individuals made their social world while the world made them (Endres & Weibler, 2017). In a social constructionist view, our social interaction produced our reality. Social constructionist emphasis on interaction led to looking at language and communication as essential mediums in self-development. Unlike leader-centric trait or situational theories of leadership, social constructionist saw leadership as recognition by others. Carroll and Levy (2010) suggested that social construction in leadership development was not limited to the social structure but may be expanded, allowing for agency, flexibility, and fluidity. Carroll and Levy noted that while society may form individuals, individuals may also display individualism counter to societal expectations. An individual may choose to construct identity in unexpected ways. An individual may select to be the type of leader one desires to be.

Drath (2001) approached leadership as knowledge principles. Knowledge principles dealt with the idea that people know it when people see it. Drath mentioned three knowledge principles behind leadership definitions and styles: personal dominance, interpersonal influence, and relational dialogue. A general agreement existed between most researchers that these characteristics constituted leadership. In the 20th century, most leadership theories revolved around the first two knowledge areas of personal dominance and interpersonal influence. The third knowledge area was a more collaborative form of leadership theory that had traction early in the 21st century. Without a relational dialogue of a shared vision, mission, goal, and commitment, leadership will ultimately fail. These ingredients appeared to be essential for groups to face adaptive and complex challenges going forward.

Project Management

PMI, a globally recognized authority and professional certifying entity for PMs, defined project management as applying understanding, expertise, tools, and practices to achieve project objectives. PMI additionally defined a project as a temporary initiative with a definite beginning and end that delivers a specific product or service within a specified period (PMI, 2017a). Project management was not a clear theory but became more complicated as a social construct with multiple perspectives (Bresnen, 2016). Project management did not have a comprehensive universal theory but rather varying supporting theories such as leadership, institutional, organizational, and complexity theories. Morris (2013) observed that project management was more art than science, requiring a multi-dimensional view of the project management theories for a more comprehensive understanding. A critical component was the human side of project management, in which PMs must master the interpersonal skills of team building, team

motivation, and successful conflict resolution. EI becomes a valuable skill set that can help PMs lead teams effectively (Galvin, Gibbs, Sullivan, & Williams, 2014).

From the 1940s to the 1990s, project management professionals advocated a universal approach to project management to assume that all projects had the same structures and processes (Niknazar & Bourgault, 2017). Project management became institutionalized, and the project management body of knowledge (PMBOK®) was established as a guide to a rigorous process for planning and implementing large complex projects (Morris, 2013). PMI was established in 1969. The goal was to bring together scientists, engineers, technicians, and project management practitioners together to promote project management as a separate discipline and establish a model for project management (Garel, 2013). While some other organizations such as the Association of Project Management (APM) began organizing starting in the 1980s, PMI became the most influential project management organization to institutionalize project management as a separate discipline and authority in developing common global standards and best practices (Bredillet et al., 2015).

PMI established a unified guide to the project management body of knowledge, known as PMBOK®, in 1987, with six knowledge areas unique to project management practices. These knowledge areas included managing scope, schedule, cost, procurement, communication, and quality. Through the years, it has slightly revised these knowledge areas (Garel, 2013). The latest PMBOK® version has 49 processes within ten knowledge areas (PMI, 2017a). The previous six knowledge areas have added integration, human resources, risk, and stakeholder management.

Bredillet (2010) suggested that project management be viewed from differing perspectives with multiple theories with fast-changing technology and business environment.

Bredillet proposed the following nine schools of thought that mirror an integrated framework of theories in project management: (a) optimization, (b) modeling, (c) governance, (d) behavior, (e) process, (f) contingency, (g) success, (h) decision, and (i) marketing school. Table 3 shows an overview of these nine schools of thought on project management and data on supporting theories and timing of theory creation. This comprehensive view is an alternative presentation of modern project management and depicts more accurately project behavior in the 2020 complex environment.

Table 3

Ideas of the Nine Schools of Project Management

School of Project Management	Ideas	Subschools	Came to Prominence	Variable or Unit of Analysis
Optimization School	Optimize project length through a mathematical process		The late 1940s	Time
Modeling School	Modeling using hard and soft systems theory	Hard systems Soft systems	The 1950s Mid-1990s	Time, Cost, Performance, quality, risk
Governance Model	Governance of the project and the relationship between participants	Contracts Temporary organization Project-based organization	The 1970s Mid-1990s Late-1990s	The project, participants, and governance mechanism
Behavior School	Management of the relationships among project participants	Organizational behavior Human Resource Management	Mid-1970s Early 2000s	People and teams working on projects
Success School	Define success and failure; identify causes		Mid-1990s	Success criteria and success factors
Decision School	Information processing throughout the project life cycle	Project selection Information processing	Late 1980s Late 1990s	Information on which decisions are made
Process Schools	Appropriate path to the desired outcomes discovered		Late 1980s	The project, processes, and subprocesses
Contingency School	Appropriate systems selected through project categorization		Early 1990s	Factors that differentiate projects
Marketing School	Support of stakeholders obtained through communication	Stakeholders Internal marketing Value of project management	Mid-1990s Mid-2000s	Stakeholders and their commitment to the project and project management

Note. Adapted from "Blowing hot and cold on project management," by C. Bredillet, 2010, *Project Management Journal, 41*(3), 4-20, p.11. doi:10.1002/pmj.20219. Copyright 2010 by Project Management Institute.

Project Manager Practitioner

In project management, the PM is the project team leader whose responsibilities include driving the project from start to finish while ensuring that the project team achieves the planning objectives (PMI, 2017a). The role of the PM is to facilitate the work completed by others. This role requires PMs to have practical project management skills and team management leadership competencies (Galvin et al., 2014). Traditional project management that focused primarily on operational efficiency in managing the triple constraints did not appear to reach satisfactory outcomes. As organizational structures became more complex, especially in the IT arena, project management skills seemed to become more vital. Navigating in the 2000s organizational environment was an art form in attempting to secure the desired team members, bring them together as a capable team, and motivate them to deliver project objectives. The leadership and soft people skills of the PM became paramount for PMs to be successful (Merrow & Nandurdikar, 2018).

Complex IT Project Failures

IT project completion rates continued to fail rapidly (Baghizadeh et al., 2020; Hughes, Rana, & Simintiras, 2017). One contributing factor was the growing complexity of contemporary system development, as discussed in scholarship and IT literature making it difficult to understand and propose solutions. The three major theoretical perspectives in the literature that analyzed information systems development failures (see Table 4) were the rationalist, process, and narrative perspectives (Baghizadeh et al., 2020). The rationalist perspective considered projects to be a defined entity that is objective, measurable, with a predetermined end state. The rationalist perspective was the most prevalent view that assessed project failures as static and deterministic caused by managerial, technological, or organizational

shortcomings (Joslin & Müller, 2015). The standard measure of success is achieving the triple constraints of budget, schedule, and scope.

Table 4

Three Perspectives on Complex IT Project Failure or Success

Perspectives	Describes IT project success or failure	Research purpose	Analysis levels	Methodology
Rationalist	Objective end state as either failure or success Outcomes caused by technology, organization, or social factors	Explain the causal relationship between failure/success Predict or prevent IT project failure	IT projects, stakeholders, and organizations	Identify major causal factors
Process	Socially and politically defined outcomes of organization processes and flaws An emergent, dynamic, and unpredictable outcome of socio-technical interaction	Identify project process flaws Avoid failure by adjusting IT projects based on timely detection of flaws	Socio-technical, organizational, and political processes	Case studies of socio-technological interaction
Narrative or social constructivist	Socially constructed narratives of failure/success Flexible interpretation of IT projects	Understand how IT project failure is narrated and interpreted by pertinent social groups Learn from failure	Organizational and socio-political processes, symbolic actions, themes, and stories	Narratives Interpretation and meaning-making by relevant social groups

Critics contended that the rationalist view missed understanding projects as socio-technical processes that developed over time in a non-deterministic and non-linear manner. In response, the process perspective considered project failures as inherent project flaws or lacking in the organizational process (Kim & Pan, 2006). Process perspective analysts proposed projects

fail from lack of organizational support, understanding of any given problem, and not providing adequate resources to save the project. Process theory introduced insights into the complexity of project failures caused by internal project issues (project management, technology, and decision making) and broader organizational processes that included upper-management, external vendors, and end-users. The process perspective looked at reversing repeated patterns of failures. From a process perspective, Pan, Pan, Newman, and Flynn (2006), identified a project failure that underestimated how an external supplier affected the project. Pan et al. corrected the issue by identifying and communicating the problem with previously uninformed upper management.

The third perspective for analyzing complex project failures took a narrative or social constructivist view. While the rationalist and process perspectives considered project failure as an objective outcome, the narrative position theorized a subjective meaning-making narrative that explained results as part of the complex nuances of the real-world interaction (Rhodes & Brown, 2005). The narrative focused on everyday interaction between different stakeholders and the ways stakeholders assess complex IT projects as failures or successes. The narrative aimed to interpret flaws in projects rather than discover causal factors, understanding that projects may be interpreted as a success, a failure, or somewhere in between, depending on the narrative's perspective. Fincham (2002) described two project examples in which differing stakeholders perceived the project as successful, while others saw the projects as failures from their perspective. Part of the issue laid in defining success or failure. When dealing with complex IT systems, development failure may be interpreted in a wide range of ways. The most severe failures were systems never instituted or abandoned. Other failure definitions included a system

that did not meet objectives, outcome failure, or failures during use. These failures resulted from changing requirements, budget or schedule overruns, or consistent operating faults.

The rationalist viewed failure as a lack of objective measurements; the process perspective looked at complex IT projects as an innovative process with no objective failure but rather a series of flaws or challenges as part of the process in achieving innovative success (Magali & Laberge, 2018). Learning and development progress may come from perceived failures, thereby a necessary part of the complex IT systems development that may lead to success. Failures may be more than a technological or systems shortcoming as the rationalist measures but rather a combination of technology and organizational roles and their interaction in the development process. Most process perspective studies showed that project failures were related to lack of upper management support, lack of value in the system, inadequate resources, or lack of involvement of end-users (Joslin & Müller, 2015).

The narrative perspective accepted a degree of flexibility in assessing project outcomes because of the interpretive, discursive, subjective, and political nature of evaluating IT projects. Each stakeholder or social group involved in the project interpreted success or failure from their perspective (Havermans, Keegan, & Den Hartog, 2015). Narrative stories varied depending on how the different actors made sense of projects and understood failures within their interpretive perspective rather than how the rationalist attributed clear causes of failure. While the narrative perspective explained specific projects with the ongoing, multifaceted relationship between social and technological actors, it tended to form characteristic findings that lack actionable generalizable knowledge.

Emotional Intelligence

Poor complex project outcomes were related to poor organizational and communication issues rather than tactical or technical implementation (Baghizadeh et al., 2020; Moyce, 2014). While strong technical skills were necessary for project management, studies have shown that EI emerged as a critical competency in project management toward successful outcomes (Maqbool et al., 2017). Since the 1990s, varying EI theories have emerged related to workplace performance, organizational behavior, organizational management, and project team leadership. In the leadership arena, EI has been tied to leadership styles such as transactional, transformational, complexity, and systems theory using various design studies such as quantitative, qualitative, and mixed-method (Bande, Fernández-Ferrín, Varela, & Jaramillo, 2015). Figure 3 captures EI's unified model with the most common themes of self-awareness, self-management, social skills, and social awareness.

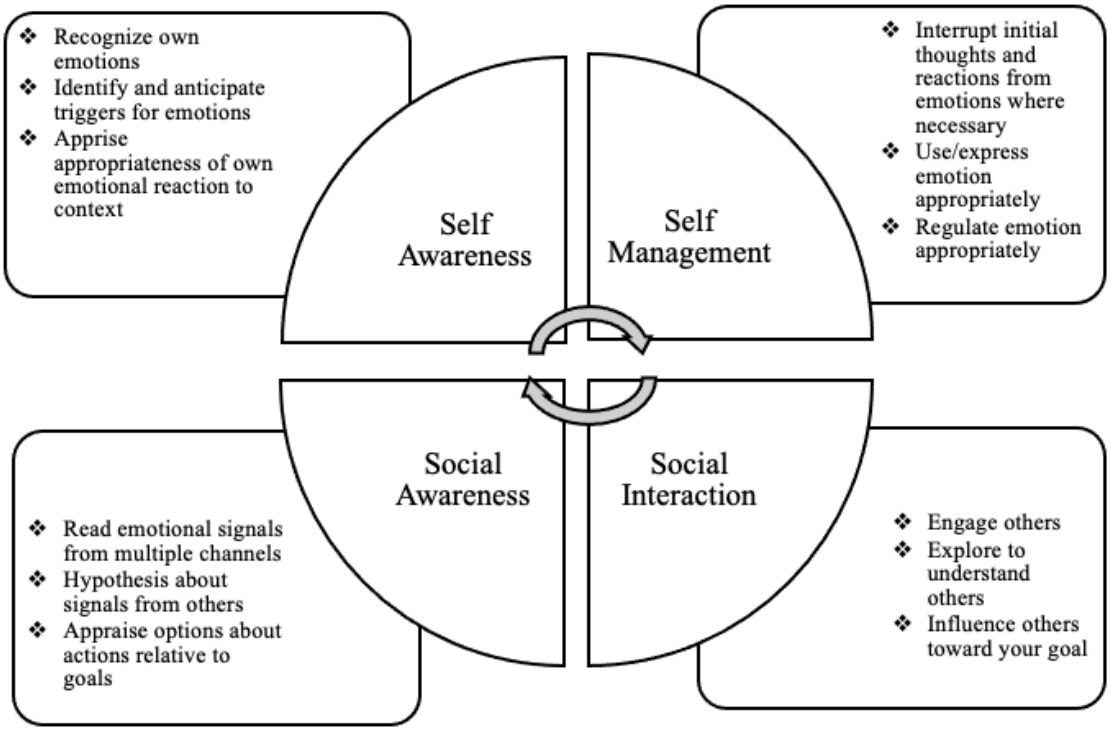

Figure 3. A unified model of emotional intelligence.

Seminal Works

The best-selling book *Emotional Intelligence* popularized the EI construct (Goleman, 1995). While considered a relatively new construct, the concept of EI as a separate intelligence from traditional logical abilities, dates to the 17th century when there was a proposal that emotion and intellect could be used in combination to measure the cognition of a person (Davis, 2011). In 1920, Thorndike proposed the concept of *social intelligence*, defined as "the ability to understand and manage men and women, boys and girls—to act wisely in human relations" (p. 228). The evolution of different types of cognition followed when Wechsler (1943) pointed out that non-intelligence abilities are related to the abilities necessary to succeed in life. Guilford (1959) started looking at intelligence as a complex construct composed of several types of

intelligence. Shanley, Walker, and Foley (1971) researched social intelligence as separate from academic intelligence. In the 1980s, academic researchers pursued conceptualizing the idea of EI. A leading proponent of multiple intelligence in the 1980s was Gardner (2011), a Harvard University psychologist. Gardner initiated the theory of multiple intelligences with major classifications of intrapersonal and interpersonal intelligence. The work that followed about EI in the 1990s and into the 2000s resulted from and built on Gardner's framework. In 1988, Bar-On first used the acronym EI in his doctoral dissertation. In 1990, Salovey and Mayer proposed EI as part of social intelligence (Mayer & Salovey, 1997). Since the 1990s, several studies have established different models of EI (Khalili, 2012). EI theories have evolved significantly to form a body of knowledge for this construct (Khalili, 2012).

Each of these models and their measurement instruments has also been questioned, discussed, and refined into three significant streams (Bar-On, 2006; Khalili, 2012). Stream one and stream two used the concept of the ability model by Mayer and Salovey (1997), but each stream used different instruments to measure the level of EI (Qualter, Barlow, & Stylianou, 2011). Stream three used the concepts of the trait-model and the competencies model. In addition to these three streams, another trait-model was also established for EI based on behavioral patterns and self-perceptions regarding one's ability to perceive, process, and utilize affect-laden information (Petrides & Furnham, 2003). The following sections address these three streams and the EI trait-model used for this study.

Mayer and Salovey's Emotional Intelligence Ability Model

From a cognitive perspective, EI is a set of abilities within the framework of intelligence. Mayer and Salovey (1997) defined EI as a combination of the following four mental abilities: The ability to identify and to be aware of emotions in oneself and others, the ability to use

emotions and integrate them into the thinking process, the ability to comprehend emotions in emotions various forms and combinations and the signals that emotions convey, and the ability to manage emotions in oneself and in others to promote emotional and intellectual growth (Mayer, Salovey, & Caruso, 2000; Salovey, Mayer, Caruso, & Yoo, 2008).

Mayer et al. (2000) developed the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) to measure EI based on the *Ability* model. The phrase *Emotional Quotient* (EQ) was introduced in this work to show equivalence with the EI measured by the Intelligence Quotient (IQ). The MSCEIT is a set of questions that evaluate how participants solve problems using their EI. Scoring is based on the correctness of the answer, compared with answers provided by a group of emotions experts or a normative sample of the general population (Salovey et al., 2008).

Though some researchers in the early 1900s mentioned EI, the term *EI* emerged into the mainstream in the 1990s when Salovey and Mayer (1990) presented their seminal framework for EI. Starting with Salovey and Mayer's work, several different models for EI were presented in the 90s that were still used in 2020 (see Table 5), with minor adjustments, to measure EI. The literature review included three EI models, followed by articles that connected EI to effective leadership, the workplace, and project management.

Table 5

Comparison of the three original major emotional intelligence models

1988 Bar-On	1990 Mayer & Salovey	1995 Goleman
Framework: Model of Well-being	Framework: Model of Intelligence	Framework: Based on the theory of performance
Category: Mixed Model	Category: Ability Model	Category: Mixed Model
Definition: An array of non-cognitive capabilities, competencies, and skills that influence one's ability to succeed in coping with environmental demands and pressures	Definition: The capacity to reason about emotions and to enhance thinking. It includes the ability to perceive, access accurately, and generate emotions to assist thought, to understand emotions and emotional knowledge, and to regulate emotions to promote emotional and intellectual growth reflectively.	Definition: The capacity to recognize our feelings and those of others, to motivate ourselves, to manage well in ourselves and our relationships
Skills Areas: Knowing one's emotions Recognizing feelings Monitoring feelings in real-time Handling feelings appropriately Ability to soothe oneself Marshaling emotions to benefit goal Empathic awareness of the needs of others	Skills Areas: Identifying and expressing emotions, feelings, and thought Identifying and expressing emotions in others Emotions generate aids to judgment and memory Ability to understand relationships associated with emotions	Skills Areas: Intrapersonal (emotional self-awareness, assertiveness, self-regard, self-actualization, and independence) Interpersonal Relationships (empathy and proficiency in managing the relationship and building networks) Adaptability (flexibility, problem-solving, and reality testing) Stress management (impulse control, stress tolerance) General mood (happiness and optimism)

For most of the 20th century, scholarly writing defined emotion within the context of a personality or social trait, rarely in the framework of intelligence. Salovey and Mayer (1990) defined emotion as a distinct intelligence, a subset of social intelligence that involved the ability to monitor one's own and others' feelings and emotions. This definition became known as the *Ability Model*, which is the most widely accepted definition for EI. The name *Ability Model* originated because the definition included one's mental ability to be aware of emotions in self and others and the mental ability to manage the emotions of self and others. Salovey and Mayer

(1990) formulated a test to measure EI called the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT). This test was widely used as of late-2020 to measure individual EI.

Bar-On and Goleman EI Mixed Model

A second theoretical model for EI emerged called the mixed model (Goleman, 1995). Bar-On (2006) expanded on the definition of EI by adding that it was not only cognitive but also encompassed non-cognitive skills to adapt and cope with environmental pressures (Bar-On, 2006). The ability model focused on the mental aspect of EI. The mixed model added aspects of the personality and the ability to perceive and manage emotions (Bar-On, 2006). Bar-On, a clinical psychologist, questioned why some people managed better psychological well-being than others did while individuals with a high IQ did not translate to the ability to deal with environmental demands. Bar-On developed an EQ (Emotional Quotient) to measure and predict an individual's ability to cope successfully with life in general (Bar-On, 2006). That measurement, EQ-i, and the short form are accepted as a valid test for EI (Parker, Keefer, & Wood, 2011).

Emotional Intelligence Trait Model

This study focused on the trait-based theory framework of EI. Petrides and Furnham (2001) developed a theoretical model of EI called the trait model that closely mirrored the streams of EI ability and mixed models. Petrides (2009) redefined the factors of EI traits as four distinct yet interconnected dimensions known as self-control, well-being, emotionality, and sociability. Each factor contained facets meant to include core elements from previous models of EI.

Petrides and Furnham (2001) defined EI as an individual's self-perception of their emotional skills. The study also developed a self-report measurement for EI. Their research

contained two studies that examined mixed experiments using the Bar-On EQ test and the researcher's self-reporting test. The hypothesis was that individuals with high EI traits would perform better at perceiving and managing emotions than individuals with low EI traits. The hypothesis showed a positive correlation between perceptions of emotions to high EI (Petrides & Furnham, 2003).

The Trait Emotional Intelligence Questionnaire (TEIQue), a self-report questionnaire, is the preferred measurement tool for Trait Emotional Intelligence (TEI). The TEIQue was developed in 2003 and came in a long and short form. The TEIQue-SF was the tool used to measure the predictor variables for this study. The TEIQue-SF includes 30 Likert-Type scale type questions, two from each of the 15 facets of TEI (Siegling, Petrides, & Martskvishvili, 2015). Cronbach's alpha reliability scores averaged .86 for well-being, .72 for self-control, .68 for emotionality, and .72 for sociability (Siegling et al., 2015).

Siegling et al. (2015) identified the TEIQue-SF as a reliable tool with positive construct validity. The short form also scored well when compared against the TEIQue long form. Research indicated results supporting strong psychometric properties in the short form and good predictive validity (Laborde, Allen, & Guillén, 2016; Stamatopoulou, Galanis, & Prezerakos, 2016). These research findings are stating the positive reliability and validity of the TEIQue-SF that justified using the tool to collect data on the predictor variables for this study.

Trait EI is a strong predictor of key positive outcomes in the workplace. A comprehensive meta-analyses research project showed robust evidence confirming that EI traits have a strong positive and significant relationship to job performance (O'Boyle, Humphrey, Pollack, Hawver, & Story, 2011). O'Boyle et al. looked at multiple studies that used the three streams of EI measurements and found that all three methods, whether ability measures, self-

reporting, or a mixed model, all predicted job performance equally well. Studies have shown a strong relationship with higher EI to job satisfaction and well-being that, in turn, resulted in higher organizational success (Ali, Bowen, & Deininger, 2019; Schutte & Loi, 2014).

A constant relationship existed between trait EI and leadership behavior and skills (Walter, Cole, & Humphrey, 2011). Most of the attention in EI studies on leadership was focused on transformational leadership behavior. Studies have shown high EI traits and transformational leadership to be closely related. High EI transformational effective leaders exhibited charismatic role-modeling, excelled in communicating a shared vision, provided intellectual stimulation, and individualized support to followers (Harms & Credé, 2010). Other studies showed a strong relationship between high EI leadership and employee satisfaction, entrepreneurship, innovation, and avoidance of counterproductive behavior (Ahmetoglu, Leutner, & Chamorro-Premuzic, 2011; Drigas & Papoutsi, 2018; Jung & Yoon, 2012).

Leadership in Action accepted EI skills as a valuable ingredient in successful leadership (Hicks & Dess, 2008). Hicks and Dess held PhDs and were considered experts in the field of leadership training. Hicks and Dess accepted early models of EI and their value in organizational leadership. Though Hicks and Dess recognized the usefulness of EI skills for effective leadership, Hicks and Dess warned of the judicious use of EI to avoid becoming overly critical or judgmental of others that may lead to ineffective leadership. Hicks and Dess also stated that while having strong empathy traits may be beneficial, confusing empathy with sympathy may prevent one from making tough decisions.

EI may be a better predictor of employees' performance and leadership than is IQ (Edelman & van Knippenberg, 2018). The evidence was examples of studies that showed the ability to know when to express positive emotions and control them to get others to cooperate

and improve overall group performance. A critical literature review on EI's effectiveness in the workplace cautioned against exaggerating the findings of EI in the workplace as being a significant indicator of job performance (Zeider, Matthews, & Roberts, 2004).

Though only 10 years old, one of the earliest quantitative studies that connected leadership EI to effective project management was Tessema's (2010) study. Tessema surveyed 578 PMs in the Washington, DC area, using the Bar-On EQ test. The data showed a positive relationship between high EI team and leadership in complex IT projects and successful project completion. Tessema's sample were government employees; therefore, Tessema recommended replicating his study to other samples that included the private sector. Studies by Nguyen (2015) and Trejo (2016) have tied high EI to successful IT project outcomes. Nguyen focused on a regional medical center in Texas, and Trejo focused on Hispanic PMs.

Nguyen (2015) researched five University of Texas Health Science Centers. Using the EQ-i scale to measure EI on 57 IT PMs, Nguyen showed some positive results regarding EQ scores and project success. Nguyen's results showed a moderate positive statistical correlation between Total EQ score and project success. A small positive statistical correlation resulted in intra-personal, interpersonal, and general mood scale scores and project success.

Trejo (2016) completed a quantitative correlational research study exploring the relationship between EI competencies and complex technology project outcomes. The study was conducted with 88 Hispanic project team members within the U.S. The research concluded the existence of some positive relationship between EI skills and project outcomes.

Thomas (2017) examined 104 construction PMs' project outcomes compared to their EI. Using the TEIQue-SF to measure the four traits EI factors of self-control, well-being, emotionality, and sociability found a positive relationship between project success and high

TEIQue scores. Recommendations for further research included expanding to other industries and different samples to corroborate the findings' repeatability and generalizability into other industries. This study used the same EI survey instrument with a different sample and industry other than information technology.

Summary

Chapter 2 presented theories on leadership, project management, and EI. Theories regarding leadership competencies emphasize the connection between skills that EI theories highlight for improved and successful outcomes. Information technology projects are a significant expense in today's corporate environment with generally less than positive outcomes. While project management training emphasizes the need for technical competencies to meet project scope, schedule, and budgets that satisfy customer expectations, the results are still lacking. The focus of this study examines if the high trait EI of practitioners in leading IT projects translates to improved outcomes. This researcher looked at the relationship between PMs' EI trait scores and that of project outcomes. This study builds on existing studies and provided additional insight into the relationship between PMs' EI competencies and successful project outcomes.

CHAPTER 3. METHODOLOGY

Introduction

The objective of this quantitative correlative research study was to examine the relationship between EI traits of PMs in the U.S. and successful completion rates of complex IT projects. The participants were information technology professional PMs certified by PMI. The researcher provided a validated online survey for the PMs. The Survey is the Trait Emotional Intelligence Questionnaire-Short Form (TEIQue-SF). The survey was preceded by qualification questions, along with demographic and project outcome questions. The survey was used to gather the data needed for the research questions and hypotheses in this study. Early 21st-century research suggested that PMs' EI attributes may have contributed to a higher rate of project success (Nguyen, 2015; Thomas, 2017). Information from this research might contribute to new insights into organizational success. Organizational leaders hiring and training personnel with higher EI may aid in positive project outcomes that, in turn, may reduce cost overruns, avoid productivity losses, and contribute to organizational profits and sustainability.

Chapter 1 included an overview of the business problem under examination, this research's purpose, and the guiding questions for the research. Chapter 2 provided supporting evidence for the usefulness of PMs' leadership skills and EI competencies that may translate into positive project outcomes. The focus of Chapter 3 relates to the research design, methodology, population, sample, and setting of the participants.

Chapter 3 defines the data collection process and specifies how the researcher gathered the data and data collection protocol. Chapter 3 includes the instrument used in the study, the selection of participants, research questions and hypothesis, data collection and analysis, ethical considerations, and concludes with a summary of the chapter.

Design and Methodology

The quantitative research method involved collecting and analyzing numerical data in explaining a phenomenon (Hackett, 2019; Yin, 2018). This quantitative correlational study examined the degree of relationship between EI traits of IT PMs and complex IT project outcomes. Using a Likert-Type survey, participants responded with a reflection of their perspective when the participant took the survey as to a percentage on a positive outcome. The research questions focused on the degree of relationship between variables. Therefore the researcher used the correlation design to analyze whether a relationship existed between the variables identified in the research study. Quantitative research design and data collection are usually conducted on a large sample of the population, and the data is scientifically analyzed through statistical methods (Hochbein & Smeaton, 2018). In social science disciplines, a survey is a standard method used for the convenience and ability to reach a large population (Hackett, 2019). Data collected from certified U.S. IT PMs occurred through an online process.

Previous researchers have used descriptive quantitative research design to examine the relationship between EI and IT project success (Nguyen, 2015; Tessema, 2010; Trejo, 2016). A quantitative correlational design was appropriate for this study and conformed to the participants investigated (Hackett, 2019). The purpose of this study was to see the extent of a relationship between two variables: IT PMs' EI traits and their project outcomes. The relationship between the four trait factors and project outcomes was examined along with a global EI score. When a theory is known, and the researcher collects data to confirm or reject a hypothesis, a quantitative method is preferred (Hackett, 2019).

The research design consisted of an instrument in an online survey format. The survey developed by Petrides and Furnham (2001) is the Trait Emotional Intelligence Questionnaire –

Short Form (TEIQue-SF). The TEIQue-SF includes 30 Likert-Type scale type questions, two from each of the 15 facets of TEI. The subscales, which make up the four predictor variables for this study, score from 26 of the 30 questions, with the other four contributing to a global TEI score (Siegling et al., 2015). The project outcome included three questions: (a) the PMs self-assessed project success, (b) whether the project met the triple constraints of scope, budget, and schedule, and (c) whether the customer thought the project was successful. These three questions were based on project success questions developed by Mir and Pinnington in 2014 as key success metrics. A demographic survey identified and qualified PMs that completed complex IT projects. The requirements for complex IT projects included the following: Project duration of a minimum of 3 months or more than $100,000, the project team of at least three members, and at least two project stakeholders impacted, internally or externally of the organization.

Population and Sampling

The population for this study was Project Management Professionals (PMPs) certified by PMI, the global leading project management organization with over 500,000 worldwide members and 280 local chapters (Project Management Institute [PMI], 2018). To qualify as a PMP requires at least 3 years' experience working on projects, at least 7,500 hours of leading projects, a 4-year college degree, and 35 hours of formal project management education. Final certification requires passing a 200-question exam within 4 hours (PMI, 2017b). According to the United States Department of Labor (USDL) statistics for 2018, the population of IT PMs in the U.S. was approximately 367,600 (USDL, 2018). Having a limited population sample with specific eligibility requirements is an accepted method in quantitative research in improving the reliability and validity of the results (Tasic & Feruh, 2012).

The sampling method is selecting a small group that is representative of a larger group to generalize the study results to the larger group (Hackett, 2019). The random sampling method is most appropriate for getting a sample of people that represents the target population. A sample attempts to be representative of the population to avoid bias. SurveyMonkey's® Audience database provided a sample of IT PMs across the U.S. representing the IT project management population. The participants consisted of willing participants that volunteered to complete the survey. Willing participants were classified as convenience sampling. The application G*Power software assessed the requirements for sample size. The G*Power formula determined a reliable sample of at least 82 participants.

The importance of sample size in this study was to ensure adequate statistical power while avoiding Type I or Type II errors. A Type I error (also known as alpha, α) is a decision to reject the null hypothesis when the null hypothesis is correct. A Type I error in research is also known as reaching a *false positive* conclusion. In a Type I error, a researcher rejects the null hypothesis when it should not have been rejected (Creswell, 2014). A Type II error (also known as beta, β) is defined as a decision to retain the null hypothesis when the null hypothesis is false. A Type II error in research is also known as a *false negative*.

In research, terms such as hypothesis, null hypothesis, alternative hypothesis, hypothesis testing, Type I, and Type II errors are often used. A hypothesis is an inference or conjecture about one or more population parameters (Hackett, 2019). The hypothesis revolved around the effect of EI traits on IT project outcomes. A null hypothesis (H_o) is a statement of no difference or no relationship in results when an independent variable is introduced, such as EI traits. An alternative hypothesis (H_a) is a claim that a difference in results between conditions is due to the introduction of an independent variable. Hypothesis testing is the inferences about the nature or

reality of the population based on the observations drawn from a sample of that population (Hackett, 2019).

Study Setting

The researcher administered the survey through SurveyMonkey®. SurveyMonkey® Audience recruited participants that met the inclusion criteria and collected the survey data. SurveyMonkey® is a leading web-based provider of web-based survey solutions for academic institutions allowing the use of their platform for research (SurveyMonkey® Audience, 2020). SurveyMonkey® Audience has targeted databases for IT PMs that they recruited by sending an email asking if PMs wanted to participate in the survey with a web address link. The link opened the participants to the Informed Consent Form. The Informed Consent Form explained the study. The Informed Consent Form described the research, data collection, storage of data, and measures taken to safeguard participants' privacy. The participants were to read the Informed Consent Form and agree to the terms by clicking Yes or No. If the participant clicked No, the participant did not consent, the survey ended. If the participant consented, then the participant answered two qualifying questions to proceed. The qualifying questions included whether the participant was a PMP and did the projects qualify as complex IT projects.

Data Collection

Data collection began upon Institutional Review Board (IRB) approval. The researcher provided the online Survey to SurveyMonkey®. SurveyMonkey® recruited participants who met the inclusion criteria of active employees of information technology firms or part of their firms' information technology department. Inclusion also included IT PMPs that worked on a project duration of a minimum of 3 months or more than $100,000, the project team of at least three members along with at least two project stakeholders impacted, internally or externally of

the organization. The survey document was previously used and identified as valid and reliable. The survey measured the EI of the participants. Permission to use the instrument, TEIQue-SF, is explained by the survey owners at the London Psychometry Laboratory website (Petrides, 2009); the survey and all associated materials can be used free of charge for academic research purposes. The survey with scoring instructions is available on the following website: http://psychometriclab.com/wp-content/uploads/2019/10/The-TEIQue-SF-v.-1.50.pdf. The survey measured the EI of participants. Measurements were performed on the degree of relationship between the independent variable of global trait emotional intelligence with four sub-variables and the dependent variable of project outcomes. The survey took about 5 to 10 minutes to complete.

Informed Consent

SurveyMonkey® offered a secure hyperlink to each participant where the Informed Consent Form and questionnaires were located with no identifiable personal participant information. After the participants signed the IRB provided Informed Consent Form to participate and details on withdrawal from the study, SurveyMonkey authorized the participants to access the survey.

Instrumentation

I used an online survey instrument to collect data and answer the research questions associated with the study. The instrument to EI is the Trait Emotional Intelligence Questionnaire-Short Form (TEIQue-SF). The TEIQue, a self-reported measure and the preferred measurement tool for TEI. The TEIQue was developed in 2003 and came in a long and short form.

Trait Emotional Intelligence Questionnaire-Short Form

The TEIQue-SF was the tool used to measure the predictor variables for this study. Petrides, the developer of the TEIQue-SF, offers the instrument for academic research without permission needed. The TEIQue-SF included a 7-point Likert-Type scale of 30 questions, two from each of the 15 facets of TEI (Siegling et al., 2015). The subscales, which made up the four predictor variables for this study, score from 26 of the 30 questions, with the other four questions contributing to a global TEI score. Cronbach's alpha reliability scores averaged .86 for well-being, .72 for self-control, .68 for emotionality, and .72 for sociability (Siegling et al., 2015).

The preceding three questions regarding project outcomes were PM's self-assessment regarding project outcomes. The factors included were project success as determined by the PM regarding customer satisfaction, and traditional measures of project success are time, cost, and scope, known as the iron triangle. The customer dimension some researchers note is the ultimate goal of managing a project is to satisfy clients. These are traditional questions used in the research literature and seem appropriate in determining project success as it touched on several definitions of project success that are generally agreed upon in project management literature (Jian, Xianbo, Nguyen, Ma, & Shang, 2018).

Dependent Variable

The dependent variable used herein was project outcomes. The project outcome included three questions: (a) the PMs self-assessment of project success; whether the project met the triple constraints of scope, budget, and schedule, (b) whether the customer thought the project successful, and (c) whether the PM considered the project successful (see Appendix A). These three questions were based on project success questions developed by Mir and Pinnington (2014) as key success metrics.

Independent Variable

The independent variable was the trait emotional intelligence of PMs. The TEIQue-SF questionnaire was used to assess the four factors of TEI of PMs consisting of self-control, well-being, emotionality, and sociability that make up the trait-based framework of EI theory along with a global EI score.

Privacy and Data Storage

The survey did not collect identifying information such as Internet Protocol addresses, participants' names, or organizations to ensure anonymity. The data from the survey is stored in a USB flash drive and locked in a secure container for 7 years past the completion of this research. The USB flash drive will be destroyed by burning by the researcher upon reaching the required time of seven years for maintaining the data.

Hypotheses

The research questions regarding project outcomes and EI competencies were examined to achieve the purpose of this study. Gaining insight into whether a leader's EI traits led to successful complex IT project management may assist organizations in their choice of personal and training programs. TEIQue-SF is a self-report survey that measures several EI factors. TEIQue-SF measures global trait EI, along with the four critical emotional trait factors of self-control, well-being, emotionality, and sociability that make up the trait-based framework of EI theory (Petrides & Furnham, 2001).

The traditional measurement of project outcome is achieving the project scope, schedule, and budget. Basten, Joosten, and Mellis (2011) provided evidence that the best measurement of project success is whether the customer considers the project successful. The present study allowed PMs to self-assess project outcomes through three assessment measurements that

include the PMP's assessment of overall success, the PMP's judgment of customer satisfaction, and the PMP's appraisal of the project meeting the triple constraints. The following research questions and hypotheses formed the basis of the study:

RQ1. To what extent, if any, does a significant relationship exist between PMs' sociability scores and the outcome of IT projects?

H_o1: There is no statistically significant relationship between the PM's sociability score and IT project outcomes.

H_a1: There is a statistically significant relationship between a PM's sociability score and the IT project outcomes.

RQ2. To what extent, if any, does a significant relationship exist between PMs' self-control scores and the outcome of IT projects?

H_o2: There is no statistically significant relationship between the PM's self-control score and IT project outcomes.

H_a2: There is a statistically significant relationship between a PM's self-control score and the IT project outcomes

RQ3. To what extent, if any, does a significant relationship exist between PMs' emotionality scores and the outcome of IT projects?

H_o3: There is no statistically significant relationship between the PM's emotionality score and IT project outcomes.

H_a3: There is a statistically significant relationship between a PM's emotionality score and the IT project outcomes.

RQ4. To what extent, if any, does a significant relationship exist between PMs' well-being scores and the outcome of IT projects?

H_o4: There is no statistically significant relationship between the PM's well-being score and IT project outcomes.

H_a4: There is a statistically significant relationship between a PM's well-being score and the IT project outcomes.

RQ5. To what extent, if any, does a significant relationship exist between global EI trait scores of PMs and the IT project outcome?

H_o5: There is no statistically significant relationship between the PM's global EI trait score and project outcomes.

H_a5: There is a statistically significant relationship between a PM's global EI trait score and the IT project outcomes.

Data Analysis

The data obtained from the survey were analyzed using a statistical methodology correlation coefficient. The statistical software program SPSS by IBM® was used to analyze the data exported from Survey Monkey®. Correlational statistical analysis is an ideal tool in studies that involve two or more variables for the investigation of a relationship between a dependent variable and an independent variable. Spearman's rank correlation coefficient (Spearman's *rho*) is a measure of the strength of a linear relationship between two variables. If the relationship between two variables is not linear, then the relationship is considered inadequate to form any conclusions (Hackett, 2019). This research intended to examine the relationship between IT project outcomes and a set of PMs EI variables (self-control, well-being, emotionality, sociability). The researcher concluded by using Spearman's *rho* (r_s) correlation coefficient model appropriate for this study.

Validity and Reliability

The validity of an instrument in scientific research is defined as whether the instrument measures what it purports to measure, and this is also known as internal validity (Hackett, 2019). A valid instrument is imperative to the confidence of a study. Another form of validity, external validity, refers to whether the research findings may be generalized across individuals, settings, and times. For this study's purpose, validity was primarily referred to as whether the instrument measured what the design claimed. Regarding the TEIQue-SF, it was considered valid if it accurately measured the PM's trait EI.

Three types of validity measurements are content, criterion, and construct validity. Content validity of a measuring instrument is the extent to which it adequately covers the questions guiding the study or simply does it measure the content it was intended to measure (Creswell, 2014). To arrive at content validity involves a degree of judgment by the designer through a logical process of carefully defining the topic, items to be scaled, and scale to be used. An independent panel may also be used to judge how well the instrument meets the standards. Content validity's primary concern is with the test construction rather than the test scores. Criterion validity, also called predictive or concurrent validity concerns with the instrument's ability to predict a criterion measure, or do the results correlate with other results? Construct validity refers to whether items measure hypothetical constructs. In more recent studies, construct validity has become an overriding objective that focuses on whether scores are useful or consequentially positive in practice (Hubley & Zumbo, 1996).

The reliability of an instrument is the degree that the results are consistent. Reliable instruments can be used with confidence that situational factors such as different times and conditions do not interfere with consistent results (Creswell, 2014). Reliability is measured

statistically using Cronbach's alpha for internal consistency. The higher the score, the better; a score of .70 or better is preferable.

Siegling et al. (2015) identified the TEIQue-SF as a reliable tool with positive construct validity. Cronbach's alpha reliability scores averaged .86 for well-being, .72 for self-control, .68 for emotionality, and .72 for sociability. The short form also scores well when compared against the TEIQue long form. Recent research indicates results supporting strong psychometric properties in the short form and good predictive validity (Laborde et al., 2016; Stamatopoulou et al., 2016). Current research findings on the positive reliability and validity of the TEIQue-SF justified the use of the tool with confidence to collect data on the predictor variables for this study.

Ethical Considerations

The research adhered to the policies and guidelines for ethical research behavior, as set forth by the University. Informed Consent Form information for each participant was available at the SurveyMonkey® website. Participants agreed by clicking YES to the Informed Consent Form before the participant had access to the survey. The Informed Consent Form included information about the purpose of the research, data collection, storage of data, and measures taken to safeguard participants' privacy.

Participation in this study was voluntary, and participants could withdraw from the study at any time. Vulnerable populations were not used in the study. The researcher minimized any potential risk to the participants and anticipated no harm to participants. This study's benefits include extending knowledge of the relationship between the EI of project PMs and project outcomes. This information may help organizations in their hiring and training employees towards higher success in IT projects.

The survey did not collect identifying information such as Internet Protocol addresses, participants' names, or organizations to ensure anonymity. The survey data will be stored in a USB flash drive and locked in a secure container for 7 years, with only myself having access to the locked container. The researcher will burn the USB flash drive at the end of 7 years.

Summary

Chapter 3 addressed the research design and method, selecting participants, setting, analyzing the research question, data collection, data analysis, ethical considerations, and concluding with a summary. Chapter 4 provides the data collection strategy, research protocol, information on the participants, the interview setting, and the data results. Chapter 5 addressed the research questions, fulfillment of the research purpose to the practice of business, limitations of the study, and future researchers' recommendations.

CHAPTER 4. RESULTS

Introduction

This study intended to examine whether a relationship existed between IT professional PMs' EI variables and self-reported project outcomes. This study's significance is that it may help organizational leaders identify critical competencies that may assist information technology (IT) PMs to improve project outcomes. The researcher attempted to identify EI components that were related to successful project outcomes. The survey instrument used in the study was the Trait Emotional Intelligence Questionnaire-Short Form (TEIQue-SF). Preceding the instrument were qualifying questions along with brief demographics and three project outcome questions. The questions in the TEIQue-SF were designed to measure the variable of EI. The criterion variable of project success revolved around the PMs' self-assessment of project outcomes.

Chapter 4 is organized by an introduction, discussion of data collection, the study participants' demographic profile, instrument reliability, descriptive statistics, data screening, and analysis of the hypotheses, and a summary of the findings. Data were analyzed with SPSS 23 for Windows. The following provides a discussion of the data collection results. There were no modifications in data collection, analysis, or processes from Chapter 3. The following were the research study questions followed by the hypothesis for each:

RQ1. To what extent, if any, does a significant relationship exist between PMs' sociability scores and the outcome of IT projects?

H_o1: There is no statistically significant relationship between the PM's sociability score and IT project outcomes.

H_a1: There is a statistically significant relationship between a PM's sociability score and the IT project outcomes.

RQ2. To what extent, if any, does a significant relationship exist between PMs' self-control scores and the outcome of IT projects?

H_o2: There is no statistically significant relationship between the PM's self-control score and IT project outcomes.

H_a2: There is a statistically significant relationship between a PM's self-control score and the IT project outcomes

RQ3. To what extent, if any, does a significant relationship exist between PMs' emotionality scores and the outcome of IT projects?

H_o3: There is no statistically significant relationship between the PM's emotionality score and IT project outcomes.

H_a3: There is a statistically significant relationship between a PM's emotionality score and the IT project outcomes.

RQ4. To what extent, if any, does a significant relationship exist between PMs' well-being scores and the outcome of IT projects?

H_o4: There is no statistically significant relationship between the PM's well-being score and IT project outcomes.

H_a4: There is a statistically significant relationship between a PM's well-being score and the IT project outcomes.

RQ5. To what extent, if any, does a significant relationship exist between global EI trait scores of PMs and IT projects' outcomes?

H_o5: There is no statistically significant relationship between the PM's global EI trait score and IT project outcomes.

H_a5: There is a statistically significant relationship between a PM's global EI trait score and the IT project outcomes.

Data Collection Results

A random selection of participants was recruited by SurveyMonkey® Audience to acquire the desired minimum sample size of 82; however, 100 participants met the inclusion criteria that completed the survey. By leveraging SurveyMonkey's database of information technology volunteer participants that are certified professional PMs in the U.S., a total of 241 respondents started the survey. However, only 100 met the inclusion criteria and completed the survey. The raw data were entered into Microsoft Excel 2016, where it was prepared for analysis.

The data collection went as planned. There were no modifications in data collection, analysis, or processes from Chapter 3. The data collection took place between February 14 through 17, 2020. The completed survey data from the 241 participants was made available to me on February 17, 2020, through the secured SurveyMonkey® Audience website

Participant Demographics

The final sample consisted of 100 survey participants. The types of IT projects were evenly distributed between web, database, and software development and network support, system implementation, and infrastructure projects. The length of experience varied with the highest percentage of 5-9 years (45%, $n = 45$). Table 6 provides detailed statistics on the demographics of the participants.

Table 6

Participant Demographics

Variable	Description	*n*	%
Years of Project Management Experience	10-14 years	24	24
	15 years or more	12	12
	2–4 years	19	19
	5-9 years	45	45
	Total	100	100
Type of IT Project	Database development	16	16
	Infrastructure project	16	16
	Network support services	10	10
	Other	2	2
	Software development	18	18
	System implementation	17	17
	Web development	21	21
	Total	100	100

Instrument Reliability for Sample

Instrument reliability for the sample was tested with Cronbach's alpha. The reliability ranged from poor (α = 0.58) to acceptable (α = 0.72) for the factors of EI with an overall internal consistency of excellent (α = .91). Two factors were questionable (α = 0.60-0.69). Three items on the survey addressed participant assessment of IT project success. The reliability of those items was acceptable (α = 0.71). Based on the literature review, Cronbach's alpha reliability scores averaged 0.86 for well-being, 0.72 for self-control, 0.68 for emotionality, and 0.72 for sociability (Siegling et al., 2015). Reliability coefficients for the sample are presented in Table 7.

Table 7

Reliability Coefficients

Variable	Cronbach's alpha for Sample	Interpretation	Literature Values
Well-Being	0.60	Questionable	0.86
Self-Control	0.58	Poor	0.72
Emotionality	0.72	Acceptable	0.68
Sociability	0.66	Questionable	0.72
All Items	0.91	Excellent	Not Reported
IT Project Success	0.71	Acceptable	N/A

Descriptive Analysis

The use of descriptive statistics permitted the researcher to organize and group the data collected into meaningful categories. Descriptive statistics is a quantitative approach to research that relies on numbers and central tendencies. From the data, descriptive research uses the numbers in a way where one can reach judgments about a proposition that we are seeking to judge as either true or false or yes or no. The analysis transformed the raw data into explanations that can be used to understand better and interpret the data. A necessary caution is that the findings are limited to the study participants and the data collected and to be careful not to generalize to a larger population. In the following section, two variables used as part of this study are analyzed using descriptive statistics to determine whether the data obtained as part of this study are normally distributed.

Scores were computed for the EI subscales. For well-being, for instance, scores ranged from 2.83 to 7.00 (M = 5.24, SD = 0.95). For self-control, scores ranged from 2.83 to 7.00 (M = 4.68, SD = 0.97). For Global EI, scores ranged from 3.47 to 6.63 (M = 4.90, SD = 0.89). The

three questions for IT project success were administered as a 5-scale Likert-Type questionnaire with a scale ranging from 0 = strongly disagree to 4 = strongly agree with the average of the answers used as IT project success. Scores for the sample ranged from 1.33 to 4.00 (*M* = 3.43, *SD* = 0.47). Descriptive statistics are presented in Table 8.

Table 8

Descriptive Statistics

Variable	*N*	*Minimum*	*Maximum*	*M*	*SD*
Well-Being	100	2.83	7.00	5.24	0.95
Self-Control	100	2.83	7.00	4.68	0.97
Emotionality	100	2.88	7.00	4.77	1.09
Sociability	100	2.33	7.00	4.79	1.02
Global EI	100	3.47	6.63	4.90	0.89
IT Project Success	100	1.33	4.00	3.43	0.47

Data Screening

The data were tested for normality with skewness and kurtosis statistics and illustrated with histograms. In SPSS, distributions are normal when the absolute values of their skewness and kurtosis coefficients are less than two times their standard errors. Based on these criteria, the distributions approximated normality except for IT project success. Skewness and kurtosis coefficients are presented in Table 9.

Table 9

Skewness and Kurtosis Coefficients

	Skewness		Kurtosis	
Variable	Statistic	Std. Error	Statistic	Std. Error
Well-Being	.019	.241	-.538	.478
Self-Control	.526	.241	-.499	.478
Emotionality	.232	.241	-1.09	.478
Sociability	.270	.241	-.584	.478
Global EI	.410	.241	-1.18	.478
IT Project Success	-.870	.241	2.70	.478

The skewness for well-being was 0.08 times the standard error. The kurtosis was 1.13 times the standard error. The histogram of well-being is presented in Figure 4.

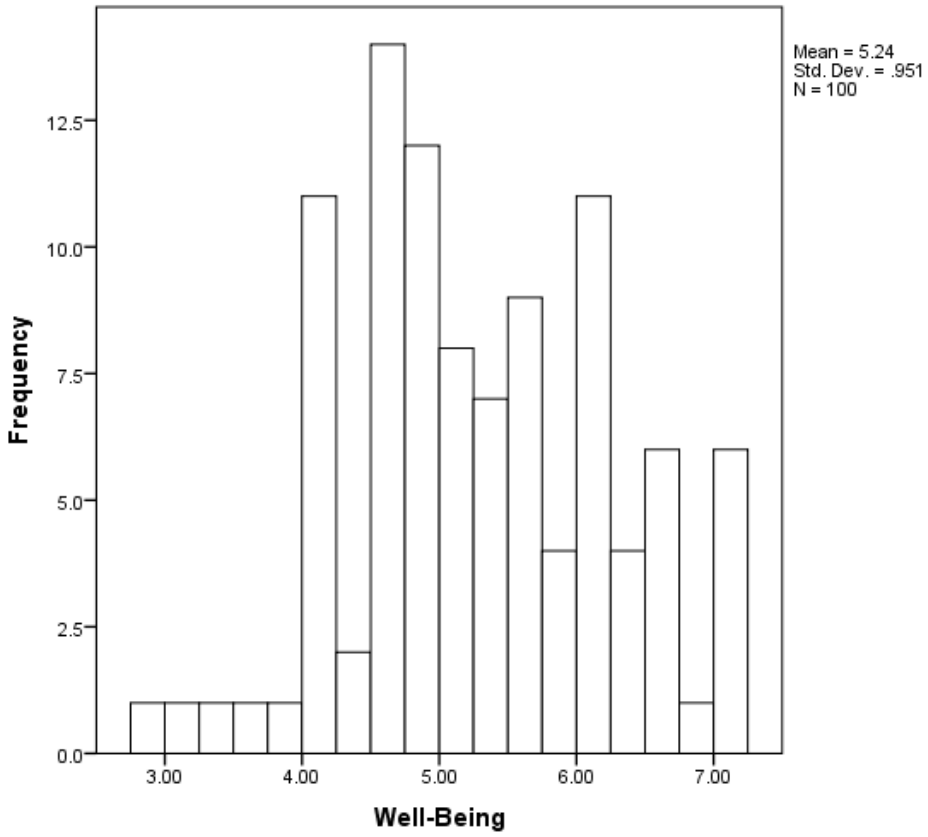

Figure 4. Histogram of well-being.

Distributions were also examined for the presence of statistical outliers with stem and leaf plots and also with box plots. Statistical outliers are displayed as points outside the whiskers in box and whisker plots. Statistical outliers are mathematically determined when outliers fall beyond 1.5 times the interquartile range (IQR). For well-being, the Mdn = 5.09. The IQR = 1.33. There were no statistical outliers. The box and whisker plot for well-being is presented in Figure 5.

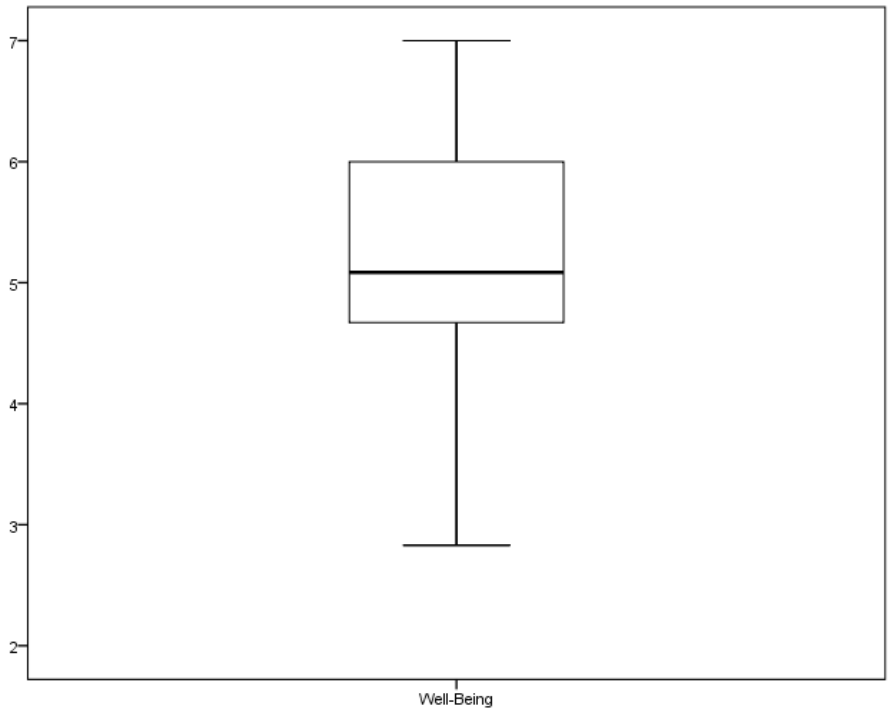

Figure 5. Box and whisker plot of well-being.

The skewness for self-control was 2.18 times the standard error. The kurtosis was 1.04 times the standard error. The histogram of self-control is presented in Figure 6.

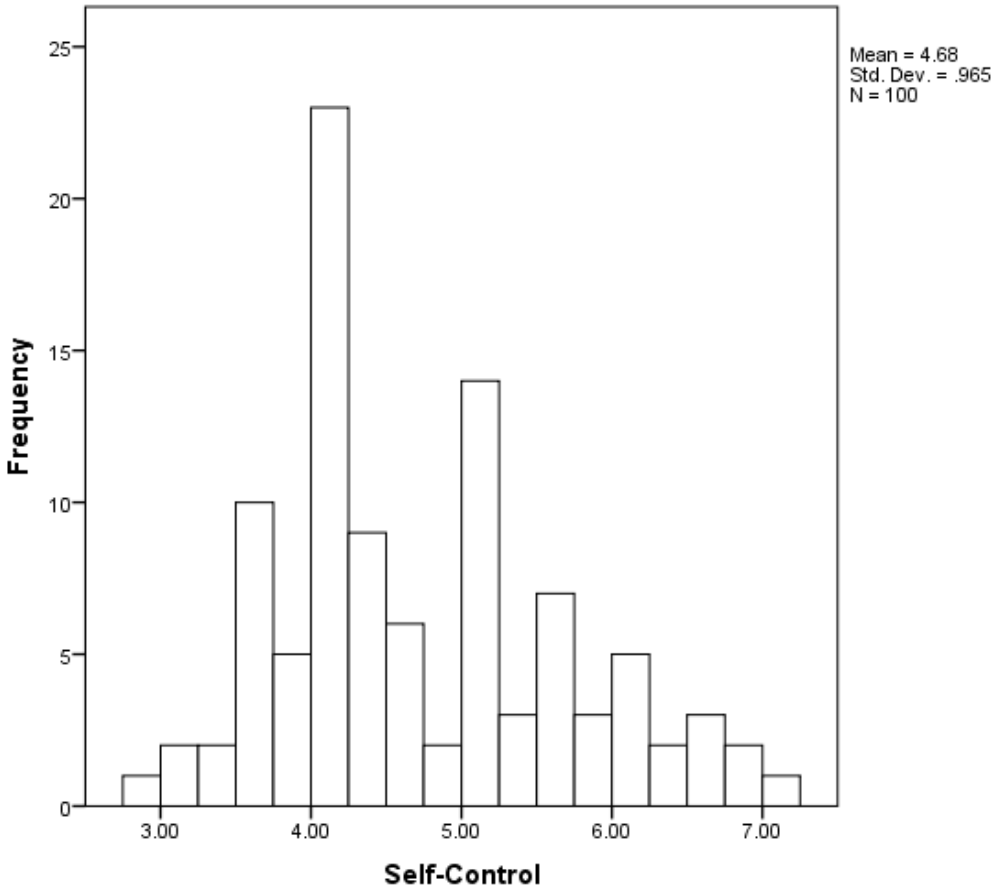

Figure 6. Histogram of self-control.

For self-control, the Mdn = 4.33. The IQR = 1.33. There were no statistical outliers. The box and whisker plot for self-control is presented in Figure 7.

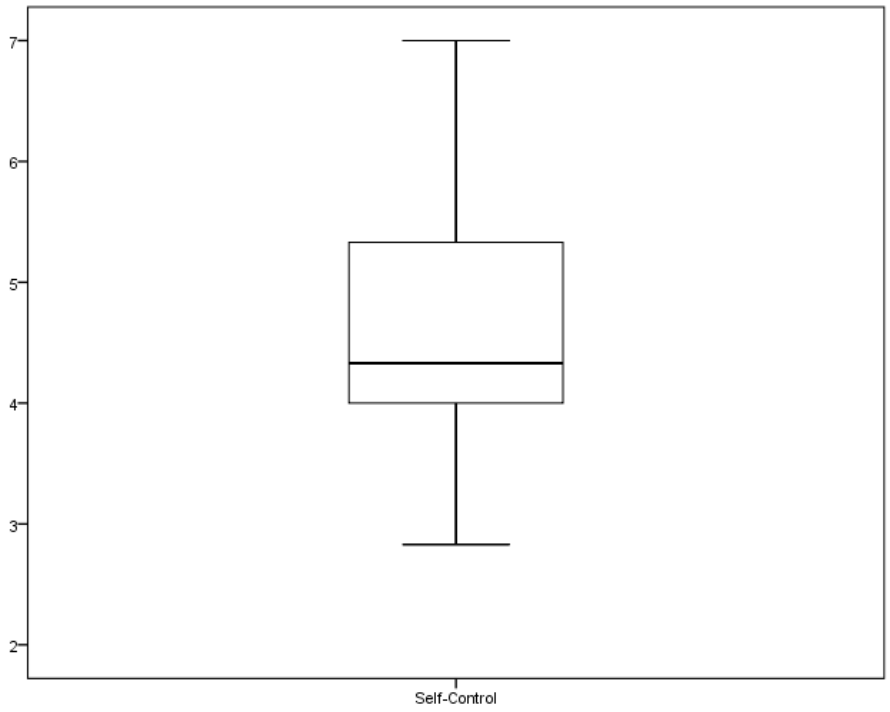

Figure 7. Box and whisker plot of self-control.

The skewness for emotionality was 0.96 times the standard error. The kurtosis was 2.28 times the standard error. The histogram of emotionality is presented in Figure 8.

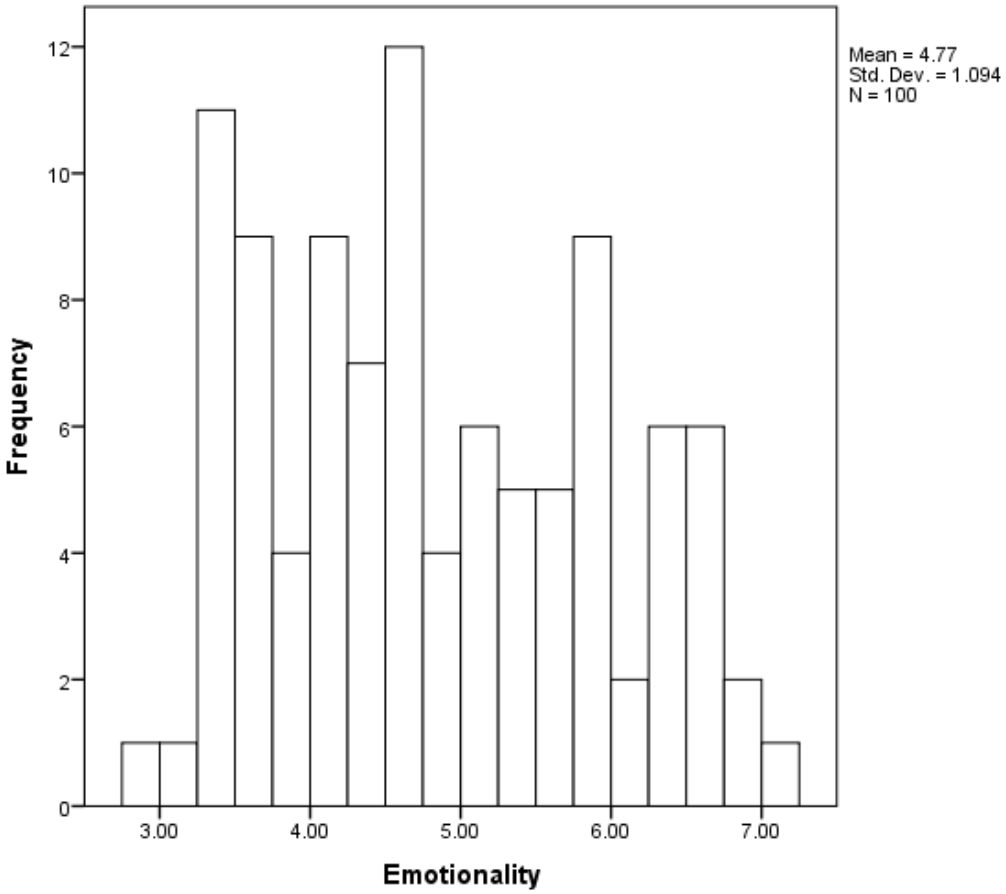

Figure 8. Histogram of emotionality.

For emotionality, the Mdn = 4.63. The IQR = 1.87. There were no statistical outliers. The box and whisker plot for emotionality is presented in Figure 9.

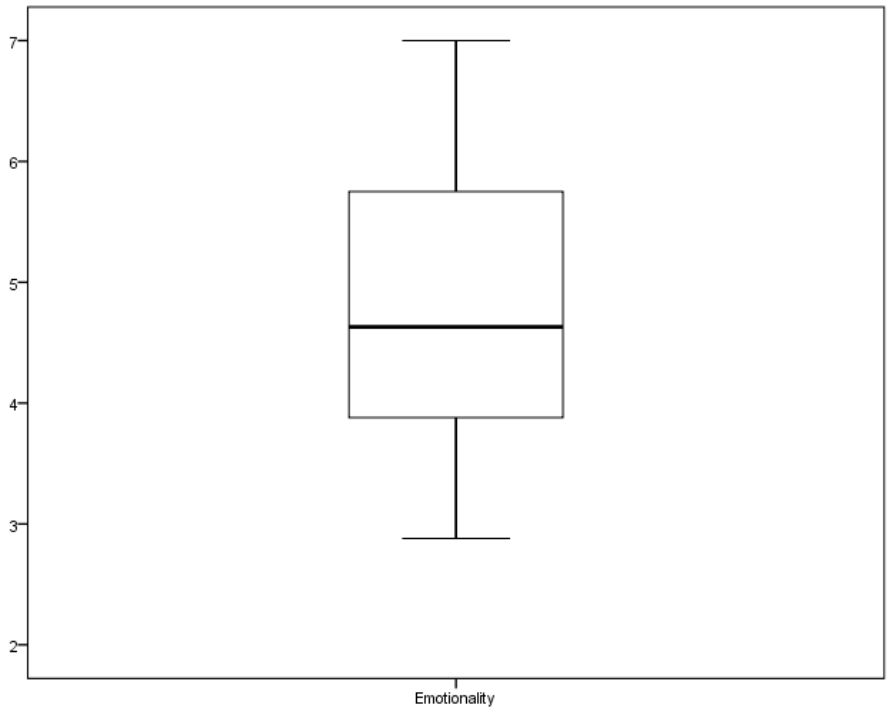

Figure 9. Box and whisker plot of emotionality.

The skewness for sociability was 1.12 times the standard error. The kurtosis was 1.22 times the standard error. The histogram of sociability is presented in Figure 10.

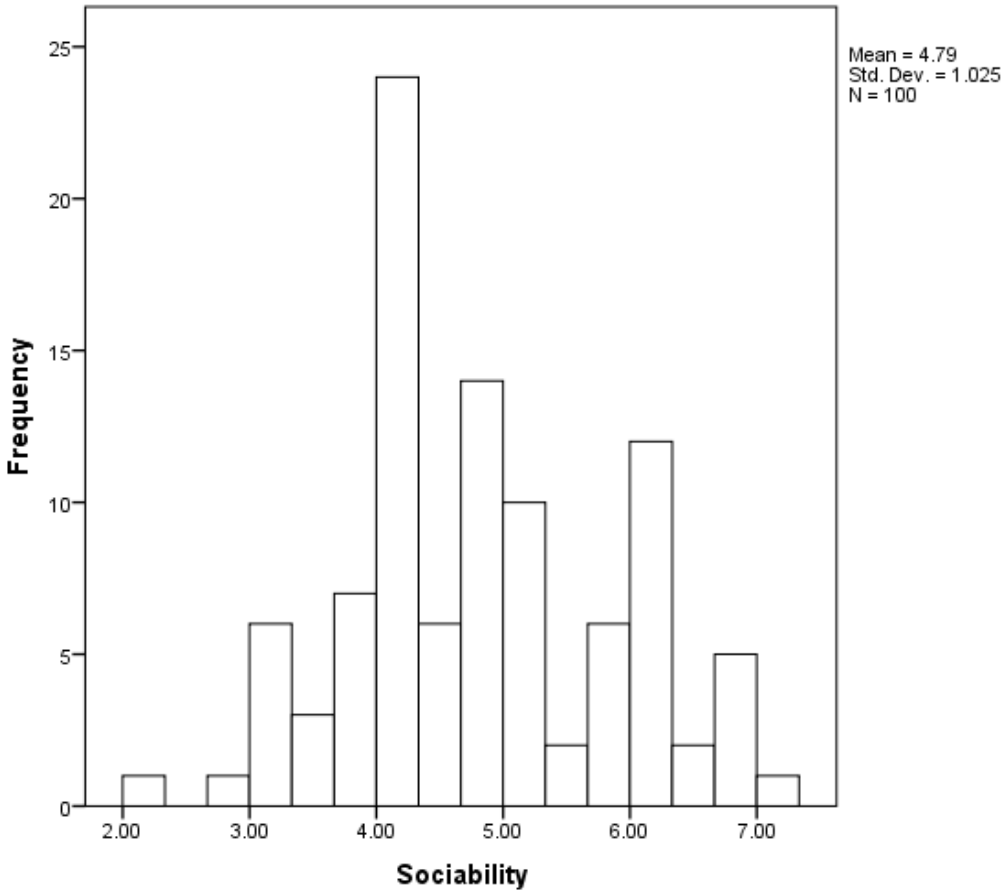

Figure 10. Histogram of sociability.

For sociability, the Mdn = 4.67. The IQR = 1.50. There were no statistical outliers. The box and whisker plot for sociability is presented in Figure 11.

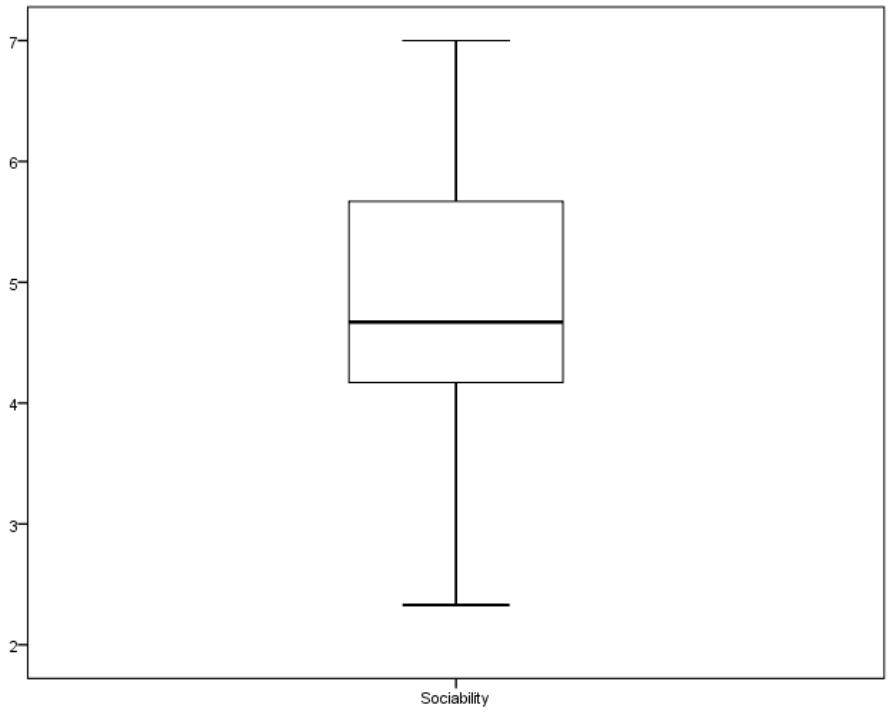

Figure 11. Box and whisker plot of sociability.

The skewness for global EI was 1.70 times the standard error. The kurtosis was 2.47 times the standard error. The histogram of global EI is presented in Figure 12.

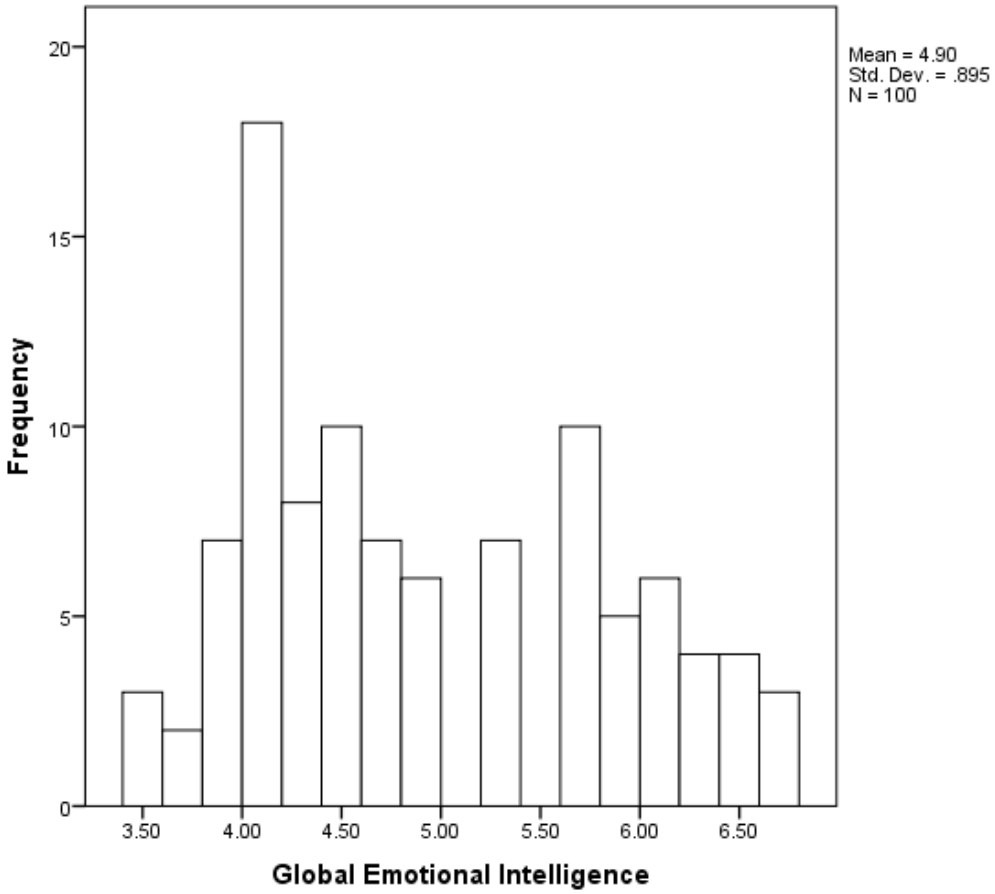

Figure 12. Histogram of global emotional intelligence.

For global EI, the Mdn = 4.70. The IQR = 1.62. There were no statistical outliers. The box and whisker plot for global EI is presented in Figure 13.

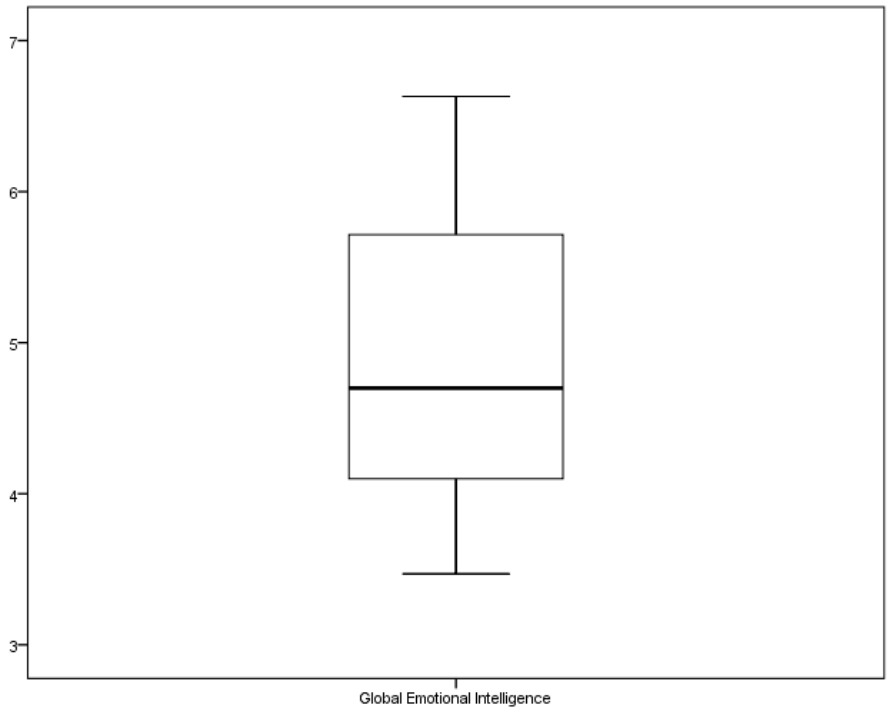

Figure 13. Box and whisker plot of global emotional intelligence.

The skewness for IT project success was 3.61 times the standard error. The kurtosis was 5.65 times the standard error. The histogram of IT project success is presented in Figure 14.

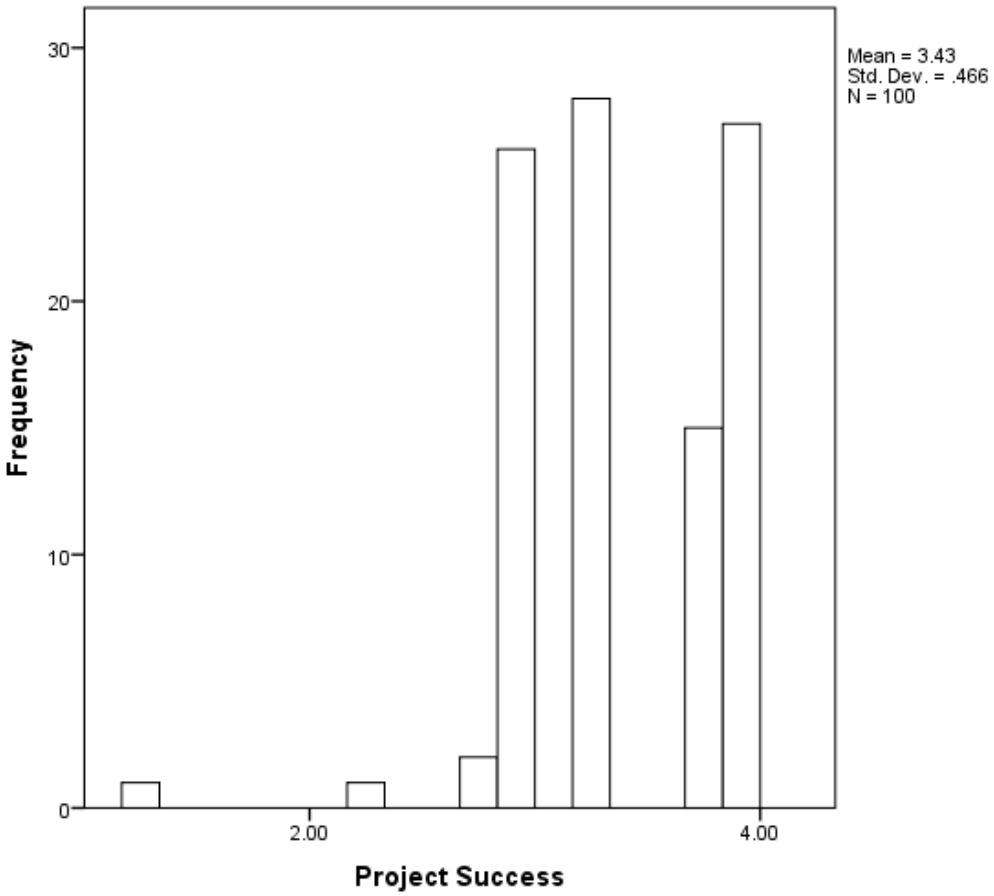

Figure 14. Histogram of IT project success.

For IT project success, the Mdn = 3.33. The IQR = 1.00. There was one statistical outlier (≤ 1.33). The box and whisker plot for IT project success is presented in Figure 15.

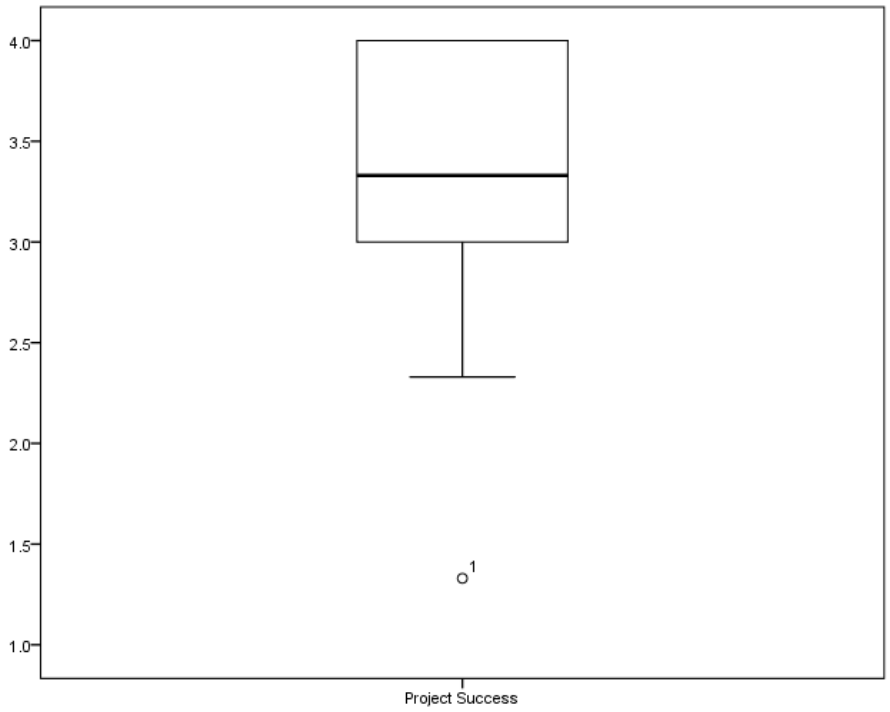

Figure 15. Box and whisker plot of IT project success.

To address the statistical outlier, it was replaced by the mean (3.43). The distribution was examined again for normality and statistical outliers. The revised mean = 3.45. The skewness was 0.19 times the standard error. The kurtosis was 2.00 times the standard error. The histogram of IT project success (outlier replaced by mean) is presented in Figure 16.

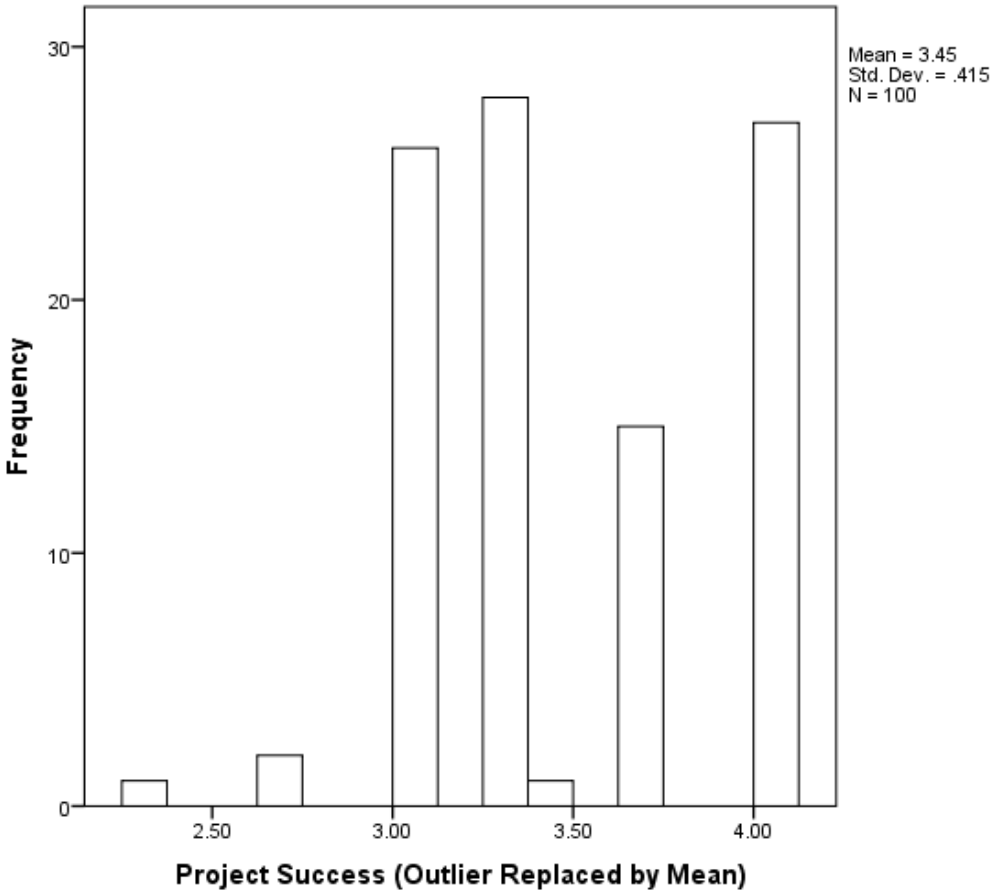

Figure 16. Histogram of IT project success (outlier replaced by mean).

For IT project success (outlier replaced by mean), the Mdn = 3.33. The IQR = 1.00. There were no statistical outliers. The box and whisker plot for IT project success is presented in Figure 17.

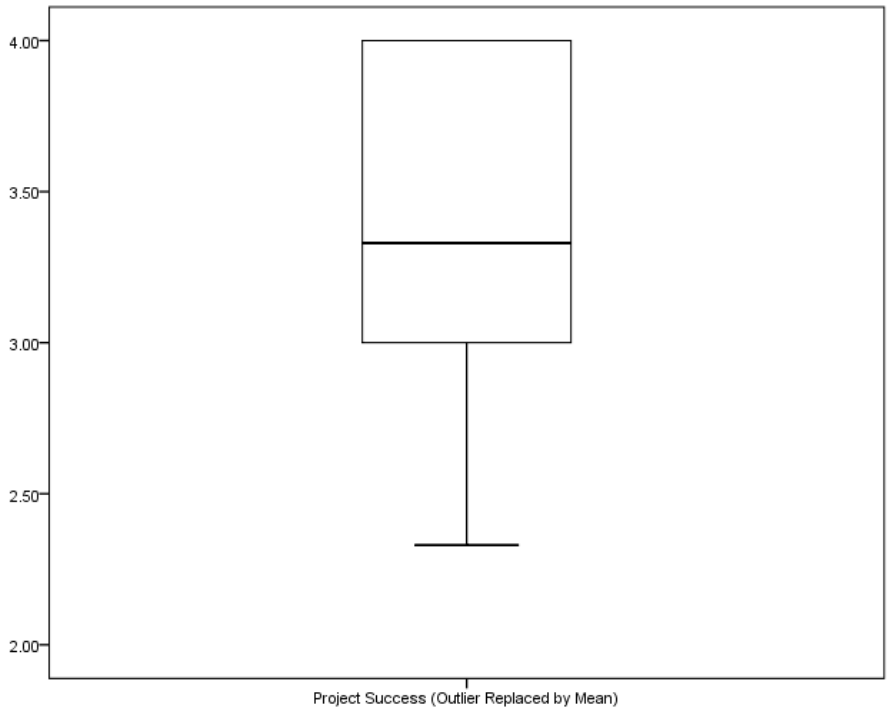

Figure 17. Box and whisker plot of IT project success (outlier replaced by mean).

Research Questions and Hypothesis Testing

Five research questions and associated hypotheses were tested with Spearman's rank correlation coefficient (Spearman's *rho*). None of the results were significant. Post hoc power analyses were conducted on the data with G*Power 3.1 to determine the achieved statistical power (Faul, Erdfelder, Lang, & Buchner, 2007). Results of the bivariate correlations with the successful outcome of IT projects, the statistical significance, and the achieved statistical power are presented in Table 10.

Table 10

Spearman's Correlation Results and Statistical Significance

Variable	$\rho\,(r_s)$	p
Sociability	0.196	0.051
Self-Control	0.107	0.290
Emotionality	0.080	0.431
Well-Being	0.060	0.554
Global EI	0.110	0.276

Note. Criterion variable = IT Project Success, N = 100, two-tailed.

Research Question 1/Hypothesis 1

To what extent, if any, does a significant relationship exist between PMs' sociability scores and the outcome of IT projects? H_{01} stated that there is no statistically significant relationship between the PM's sociability score and IT project outcomes, r_s = .196, p = .051. Therefore, the null hypothesis was not rejected.

Research Question 1/Hypothesis 2

To what extent, if any, does a significant relationship exist between PMs' self-control scores and the outcome of IT projects? H_{02} stated that there is no statistically significant relationship between the PM's self-control score and IT project outcomes, r_s = .107, p = .290. Therefore, the null hypothesis was not rejected.

Research Question 3/Hypothesis 3

To what extent, if any, does a significant relationship exist between PMs' emotionality scores and the outcome of IT projects? H_{03} stated that there is no statistically significant relationship between the PM's emotionality score and IT project outcomes, r_s = .080, p = .431. Therefore, the null hypothesis was not rejected.

Research Question 4/Hypothesis 4

To what extent, if any, does a significant relationship exist between PMs' well-being scores and the outcome of IT projects? H_{04} stated that there is no statistically significant relationship between the PM's well-being score and IT project outcomes, $r_s = .060$, $p = .554$. Therefore, the null hypothesis was not rejected.

Research Question 5/Hypothesis 5

To what extent, if any, does a significant relationship exist between global EI trait scores of PMs and the IT projects' outcomes? H_{05} stated that there is no statistically significant relationship between the PM's global EI trait score and IT project outcomes, $r_s = .110$, $p = .276$. Therefore, the null hypothesis was rejected. Hypotheses and outcomes are summarized in Table 11.

Table 11

Hypotheses and Outcomes

Hypothesis	Significance	Outcome
H_{01}: There is no statistically significant relationship between the PM's sociability score and IT project outcomes.	$p = .051$	Null Not Rejected
H_{02}: There is no statistically significant relationship between the PM's self-control score and IT project outcomes.	$p = .290$	Null Not Rejected
H_{03}: There is no statistically significant relationship between the PM's emotionality score and IT project outcomes.	$p = .431$	Null Not Rejected
H_{04}: There is no statistically significant relationship between the PM's well-being score and IT project outcomes.	$p = .554$	Null Not Rejected
H_{05}: There is no statistically significant relationship between the PM's global EI trait score and IT project outcomes.	$p = .276$	Null Not Rejected

Summary

Five research questions and related hypotheses were examined. However, none of the results were statistically significant. Specifically, it was determined that there was no significant relationship between PMs' sociability scores and the outcome of IT projects. There was no significant relationship between self-control scores of PMs and the outcome of IT projects. There was no significant relationship between the emotionality scores of PMs and the outcome of IT projects. There was no significant relationship between the well-being scores of PMs and the outcome of IT projects. There was no significant relationship between global EI trait scores of PMs and the outcome of IT projects. Implications and recommendations were discussed in Chapter 5.

CHAPTER 5. CONCLUSIONS

Introduction

Organizations throughout the U.S. face a continuing dilemma of failed complex IT projects, resulting in billions of dollars in loss profitability annually (Krasner, 2018). PMI (2018) found that the number of failed projects is not improving, as there remains 68% of IT project failure. While well-trained PMPs with high technical skills still do not achieve a high success rate, some literature suggests that improving PMs' EI may offer a solution (Nguyen, 2015; Tessema, 2010; Trejo, 2016). The poor success rate of complex IT projects has the foundation of this quantitative correlational study to examine if, and to what extent, a correlation existed between EI traits of certified professional PMs and complex IT project success. The G*Power formula was used to determine a reliable sample of at least 82 participants. The final sample consisted of 100 survey participants.

Previous studies (Dean & East, 2019) have shown a statistically significant relationship between EI and leadership success. Studies in project management other than the information technology industry, such as construction projects, have shown a positive correlation between EI and project success (Thomas, 2017). A few studies between EI and IT projects have demonstrated a degree of relational significance (Nguyen, 2015; Tessema, 2010; Trejo, 2016). This study did not attain a significant relationship between the EI of PMs and project outcomes. Chapter 5 presents the study's findings, the evaluation of the research questions, fulfillment of the research purpose, contributions to the business problem, and recommendations for further research.

Evaluation of Research Questions

The study focused on whether EI traits significantly contributed to successful project outcomes. The research was guided by the following five questions: measurement of Trait EI, including sociability, self-control, well-being, emotionality, and a global emotional trait score (Petrides & Furnham, 2001).

RQ1: To what extent, if any, does a significant relationship exist between sociability scores of PMs and the outcome of IT projects?

RQ2: To what extent, if any, does a significant relationship exist between self-control scores of PMs and the outcome of IT projects?

RQ3: To what extent, if any, does a significant relationship exist between emotionality scores of PMs and the outcome of IT projects?

RQ4: To what extent, if any, does a significant relationship exist between well-being scores of PMs and the outcome of IT projects?

RQ5: To what extent, if any, does a significant relationship exist between global EI trait scores of PMs and the outcome of IT projects?

The five research questions and associated hypotheses were tested using Spearman's rank correlation coefficient, or Spearman's *rho* (r_s), a measure of the strength and direction of the association between two variables measured on at least an interval scale. Pearson's product-moment correlation is used when the data distribution is normal (among other assumptions). However, the Project Success variable's distribution, which all other variables were correlated against, was not normal; therefore, Spearman's was used. The two key assumptions that must still be met to apply Spearman's are (a) the data is an interval, ratio, or ordinal, and (b) the two columns to be tested are monotonically related. Spearman's r_s values fall on the range [-1,1].

Any result for r_s that satisfies $0 < r_s <= 1$ indicated a positive association, meaning that as one variable increases, the other increases as well. Any result for r_s that satisfies $-1 <= r_s < 0$ indicated a negative correlation meaning that as one variable increases, the other decreases. When $r_s = 0$, there is no correlation at all present. The stronger the association of the two variables, the closer the Spearman's correlation coefficient will be to either -1 or 1 depending on whether the relationship is negative or positive, respectively.

Research Question 1

When considering Research Question 1, to what extent, if any, did a significant relationship exist between sociability scores of PMs and the outcome of IT projects? With a threshold of $p = .050$, this research question came the closest to having a positive relationship. There was no significant relationship between PMs' sociability scores and the outcome of IT projects, $r_s = .196$, $p = .051$. The null hypothesis, H_{01}, stated that there was no statistically significant relationship between the PM's sociability score and project outcomes, and the null hypothesis was not rejected.

Sociability, as a construct in business, relates to the ability through interpersonal skills to influence others towards the desired outcome. The TEIQue survey has three qualities that come under sociability (a) the ability to manage the emotions of others, (b) assertiveness, and (c) social awareness. PMs in an IT setting, as examined in this research, showed above-average sociability scores on the TEIQue. A subsequent attempt was made to correlate that score to the overall performance of a project. However, Spearman's *rho* value showed no statistically significant correlation between the sociability score and IT project outcomes.

Trejo (2016), in his study of Hispanic IT PMs, found a moderate positive statistical correlation between emotional awareness and emotional management of others, that closely

coincides with sociability in this study and IT project success. Trejo's success instrument showed reliability coefficient values around .70 and one factor less than .70, which some researchers may consider a weak reliability instrument. Nguyen (2015) showed a moderate positive relationship between IT PM's interpersonal skills and project success, as perceived by the project customer. While these studies showed some positive correlation between sociability and IT project success, the results were not overwhelming.

According to Morris (2013), sociability was strongly connected to effective leadership in project outcomes as the PMs must effectively master interpersonal skills of team building, motivating, and conflict resolution. However, Kim and Pan (2006) looked at a process perspective and averred that leadership and successful project outcomes were not conflated in the context of IT management versus leadership roles. Process perspective analysts proposed that projects failed due to a lack of organizational proficiencies rather than solely a PM's incompetency. Process theory proposed insights into complex project failures caused by project management and poor organizational decision-making, inadequate technology, and issues that arose from upper-management support, external vendors, and end-users. Rhodes and Brown (2005) advanced that complex IT projects were often viewed as successful and failures dependent on the stakeholder's point of view. Having fulfilled the project requirements from their viewpoint, PMs were more likely to view a project as successful while the end-user not satisfied with the end product may consider the project a failure.

Transference between quantitative metrics and qualitative input from stakeholders and decision-makers can present a researcher with issues designing a robust enough questionnaire to capture the needed data and information. Other studies by Thomas (2017), Trejo (2016), and Nguyen (2015) have either aligned or opposed the methods applied to the questions used in the

present research. For example, Thomas used 21 questions concerning project outcomes, while Trejo used nine questions, and Nguyen used one question. The questionnaire employed in this research with three questions may have presented the respondent with too narrow a focus to ultimately produce a large enough variance in the resultant data for the *Project Success* variable. A correlation is the result of covariance divided by the products of the standard deviations of two values, and a low variance value must result in weak or no correlation. Thus, as discussed further in the *Future Research* section of Chapter 5, the adjustment of the survey instrument may elucidate the limitations of the current instrument and allow for expansion and resampling in a later project.

Research Question 2

Research Question 2 examined to what extent, if any, did a significant relationship exist between PMs' self-control scores and the outcome of IT projects? The null hypothesis, H_{02}, stated that there was no statistically significant relationship between the PM's self-control score and project outcomes. The test results revealed no significant relationship between PMs' self-control scores and the outcome of IT projects, $r_s = .107$, $p = .290$. As such, the null hypothesis was not rejected.

The personality trait of self-control encompasses the factors of (a) emotion control, (b) impulse control, and (c) stress management. These are personality traits that can reflect, control urges, withstand, and regulate pressure (Petrides et al., 2016). Leadership researchers advanced the notion that managing conditions of stress and uncertainty is necessary for leading teams through complex projects (Maqbool et al., 2017). Bandura (1977) stated that high arousal in a stressful situation might reveal personal competency in the emotional state. The highly charged emotional state may impede sound judgment, thereby creating a sense of inability of an

individual to handle threatening situations capably. The ability to control emotion in a stressful situation that may often arise in complex projects may determine a successful outcome.

Research Question 3

When examining Research Question 3, to what extent, if any, does a significant relationship exists between emotionality scores of PMs and the outcome of IT projects? H_{03} stated that there is no statistically significant relationship between the PM's emotionality score and IT project outcomes. There was no significant relationship between PMs' emotionality scores and the outcome of IT projects, $r_s = .080$, $p = .431$. Therefore, the null hypothesis was not rejected.

Emotionality, in terms of Trait Emotional Intelligence construct, is associated with one's personality (a) being able to empathize, (b) perceive emotions in self and others, (c) capable of expressing their emotions to others, and (d) maintaining fulfilling relationships with others (Petrides et al., 2016). The capacity to take others' perspectives, manage emotions in self and others, and maintain positive relationships is well documented in leadership literature as effective leadership skills. This construct also aligns with other EI constructs as the ability to have a positive interpersonal relationship that is key to positive leadership qualities.

Complex IT projects may involve many stakeholders. How well these relationships are managed may spell the difference between project success and failure. Endres and Weibler (2017) advanced the notion of the importance of social interaction skills in building relationships towards leadership success.

Research Question 4

Research Question 4 assessed if a relationship exists between PMs' well-being scores and the outcome of IT projects? H_{04} stated that there is no statistically significant relationship

between the PM's well-being score and IT project outcomes. There was no significant relationship between PMs' well-being scores and the outcome of IT projects, $r_s = .060$, $p = .554$. Therefore, the null hypothesis was not rejected.

When looking at well-being attributes, Trait Emotional Intelligence breaks it down into three factors, (a) trait optimism, (b) trait happiness, and (c) self-esteem. Leaders possessing these traits are satisfied with their lives, confident, and are likely to be positive and cheerful (Petrides et al., 2016). Leadership researchers found that trait optimism may positively affect complex technology projects by improving decisions, efficiency, and outcomes (Ali et al., 2019). While in this research, the results do not show a positive relationship between well-being and IT project outcomes, that may be due to this study's limitations.

Research Question 5

Finally, Research Question 5 considered whether any relationship exists between global EI trait scores of PMs and the outcome of IT projects? H_{05} stated that there is no statistically significant relationship between the PM's global EI trait score and IT project outcomes. There was no significant relationship between global EI trait scores of PMs and the outcome of IT projects, $r_s = .110$, $p = .276$. Therefore, the null hypothesis was rejected.

Global trait EI is an aggregation of the previous four factors that make up Trait EI, (a) sociability, (b) emotionality, (c) self-control, and (d) well-being. The instrument used four different questions to assess a global EI score, and this is not an average of the previous four EI traits. Researchers have found a positive relationship between leadership success and high EI scores. Studies have shown a strong linkage between leadership, EI competencies, and workplace performance (Dean & East, 2019). Previous researchers found that high EI in PMs has shown a positive relationship in IT project outcomes (Nguyen, 2015; Trejo, 2016).

Nguyen's and Trejo's research were limited to a narrow geographical medical center in Texas and a narrow ethnic sample (Hispanics). The survey in the present study was broadly distributed across the U.S. without distinction to industry or ethnicity. Further research into whether EI correlates to successful projects may suggest IT projects' effectiveness by expanding the sample, comparing industries, and organizational maturity.

Fulfillment of Research Purpose

The purpose of this quantitative correlative research study was to examine whether a relationship exists between EI traits of PMPs in the U.S. and successful completion rates of complex IT projects. The study consisted of five variables comprising of the facets of Trait Emotional Intelligence and a Global EI score and their relationship to IT project outcome. The study's focus was from the perspective of the PMs and their perception of the success of projects. As defined by PMI, project success is achieving the triple constraints of schedule, budget, and scope (PMI, 2018). A sample of 100 credentialed PMPs took part in a survey administered by SurveyMonkey® that consisted of the TEIQue-SF survey instrument and three questions regarding IT project success.

Studies on the relationship between EI and effective leaders are abundant (Prezerakos, 2018). Numerous studies have confirmed a reliable link between EI with effective leadership and managerial performance (Silva, 2020). A linkage exists between EI, team performance, group cohesiveness, and positive conflict management skills (Al-Hamdan et al., 2018; Rezvani et al., 2018). This study attempted to measure if PMs with high EI translated to complex IT project success and build on previous studies on the potential relationship between EI and IT project success (Nguyen, 2015; Tessema, 2010; Trejo, 2016).

According to Greenwald (1975), the research and publication system can suffer when researchers are focused on publishing positive results. Greenwald stated that there are "few publications on problems for which the null-hypothesis is (at least to a reasonable approximation) true" (p. 1), and further, “conclusions about relationships among variables should be based only on rejections of the null hypothesis” (p. 2). That paper underscored the need to avoid the practice of looking for results where none exist, what is termed either “*p*-hacking" (working and re-working statistical analysis until the desired result is achieved, or modeling so many iterations that one is bound to be significant; usually a low *p*-value is the target), or hypothesis after result is known (HARKing), which is the *post hoc* formulation of a hypothesis or hypothesis to fit the examined data structures and emergent relationships (Earp, 2018). This is not a new problem and can be traced back to a short communication by Earp (1927), in which he stated that “one of the things we practitioners sometimes neglect is the reporting of failures” (p. 119).

Using the widely recognized TEIQue-SF survey instrument, the perspective of PMs and their insight into their EI and IT project outcomes were analyzed. Aligned with the limited literature on this topic, this study did not confirm that the EI of PMs alone and complex IT project success had a significant relationship. However, previous studies (Tessema, 2010; Trejo, 2016) have found weak to moderate correlations between similar variables, as examined here. As such, the research fulfilled the purpose of providing additional research-based support to the idea that a relationship between EI and project outcomes is either (a) virtually non-existent, (b) weak, or (c) of such complexity in terms of multi-dimensionality and dependent-independent variable relationships that statistical tests on the simpler end of the spectrum do not possess the

robustness or explanatory power to unveil either the diagnostic or synoptic characteristics in this system.

Contribution to Business Problem

Considerable emphasis on resolving poor project outcomes are directed toward improving PM technical skills. At the same time, little attention has been paid to the PMs' leadership traits leading those projects. Of an estimated $1 trillion spent on IT projects annually in the U.S., at best, only 29% are delivered successfully, costing organizations over $170 billion in losses (Krasner, 2018). PMI (2018) projects little improvement in these numbers. Accordingly, there is a concurrent need to obtain a fuller understanding of and better knowledge about how the EI of a PM relates to the leadership potential required for achieving a successful IT project outcome. The general business problem is that the rate of failure of IT projects is increasing and thus contributing to decreased organizational profitability (Baghizadeh et al., 2020). The specific business problem is little knowledge relating to the relationship between the EI traits displayed by PMPs in the U.S. and the successful outcomes of the IT projects PMPs manage.

While positive results are inherently desirable (it is assumed that the case can be made with no citation that a researcher inherently wishes for their research to be *successful* in the context of positive results—or rejecting the null hypothesis), it is vital to contribute negative results as well. The goal is to uncover new truths and add new knowledge to the discipline. In this regard, although regrettable to the researcher, the addition of knowledge to the literature further highlights that the link between EI and complex IT project outcomes is tenuous at best. PMs possessing highly developed social skills have been shown to be successful leaders in numerous studies (Bredillet et al., 2015; Dabke, 2016; Prezerakos, 2018; Silvius, 2016;

Skrzypczyńska, 2018), but this link does not appear to exist in the context of the present research of complex IT project outcomes and relationship to EI competency.

Connections have also been uncovered between EI, team performance, group cohesiveness, and positive conflict management skills (Al-Hamdan, et al., 2018; Rezvani et al., 2018). All of these relationships have seemed to indicate that PMs with high EI skills may lead and deliver complex IT projects successfully. However, with limited research on the connection between EI and successful IT project outcomes, and with the present study uncovering no correlations based on the sample population herein, the contribution to the body of knowledge on this topic must be reported as negative findings.

According to Ajam (2017), project management models such as the spiral method, V-shaped, waterfall, and evolutionary prototyping have achieved convergence in value-added for improving efficiency in outcome management. Research may benefit from a practical standpoint based on the present findings housed in the conceptual and operational containers of soft skills (Dean & East, 2019). If continued research consistently reports that the soft skill (or perhaps better stated as a characteristic or set of characteristics) of dealing with people on an emotional level (measured by the TEIQue-SF) is not a significant contributor to the success of IT projects, then attempts to advance the knowledge of where resources may better be spent could be directed elsewhere.

Findings Evaluated via Theoretical Framework and Previous Literature

Theoretical frameworks on leadership, project management, and EI theories grounded this study and concentrated on the EI of the PM's following studies completed by several researchers in the area of complex IT project success (Nguyen, 2015; Trejo, 2016). PMs are team leaders and managers, and as such, not just project management-based theories were vital

for this study. The combination of leadership and EI theories were also called upon to provide support and structure in that a PM is not merely a *manager* of a *project* in the objective sense, but a holistic leader of a team. This position seemingly would require EI.

The trait-based framework of EI was the primary theoretical vehicle employed in the present research. Developed by Petrides and Furnham (2001), this framework features an alternative view of traditional intelligence that contributes to a distinctive explanation of leadership success. Four fundamental factors consist of self-control, well-being, emotionality, and sociability, with 13 sub-facets that constitute EI theory's trait-based framework. The primary proposition of trait EI theory is that of construct personality traits instead of abilities (Petrides & Furnham, 2001). Research conducted by Siegling et al. (2014) identified TEI as a predictor of individual success. The trait model of EI theory was used to compare EI to project outcomes. The Trait Emotional Intelligence Questionnaire Short Form (TEIQue-SF) compares PMs' EI to project success.

A paradigmatic shift in thinking and leadership development approaches took place at the beginning of the 21st century. A more inclusive, interactive, complex, adaptive, collaborative, and relational approach to leadership development theories had evolved (Dabke, 2016; Skrzypczyńska, 2018). Maqbool et al. (2017) made a case that while strong technical skills are an essential requirement for PMs; additionally, EI is a critical competency in project management toward successful outcomes. A significant component of EI is mastering interpersonal skills of team building, motivating, and conflict resolution. Transformational leadership theory in scholarly literature rose to prominence in cognate disciplines during the 2000s. Many transformational leadership concepts, such as strong interpersonal and

intrapersonal social skills, the ability for empathy, emotion control, and stress management, closely align with EI attributes.

Relational, complexity, and systems leadership theories share many similarities and insights with the leadership skills needed in a complex project management environment. Relational and systems leadership theories contend that developing and building relationships is the key to leadership effectiveness (Nicholson & Kurucz, 2019). As proposed by Uhl-Bien et al. (2007), complexity theory viewed leadership as a network of individuals bonded in a cooperative, interactive effort by a common goal. Complexity theory can be described as adaptive leadership with the ability to produce positive outcomes with a dynamic, interactive dialogue that fosters creativity and learning throughout an organizational structure.

Moliterno and Mahony (2011) postulated that organizations are made up of multiple layers of networks influencing each other, thereby forming a social system multi-layered network theory. Smith and Lewis (2011) discussed contradictory theories regarding organizing, such as collaboration versus control, individual versus the collective, and flexibility versus efficiency. How leaders respond to these paradoxes may determine success in a complex, dynamic, and stressful environment. Smith and Lewis warned to avoid vicious cycles that have adverse outcomes from a need for consistency, defensiveness, and emotional anxiety. Virtuous cycles were encouraged by acceptance and resolution strategies. Ford (2006), when discussing a postmodern leadership standpoint, viewed organizational changes as requiring opportunities for open, communicative interaction, safeguarding the process, and allowing the expression of repressed views. Many leadership theorists affirmed that successful organizations supported effective relational, interactive communication such as time for dialogue, active listening, and

clarity (Hills, 2013). Sodeke et al. (2010) provided suggestions for a suitable communication environment that fostered transparency, respect, humility, and trust.

Peer-reviewed literature on leadership cocreation agreed that some form of one or a combination of personal experience, interaction, reflection, and feedback played a part in leader development and self-portrait (Luu, 2019). The social constructionist basic theory stated that individuals made their social world while the world made them (Endres & Weibler, 2017). The positive feedback from others and positive experiences over time added to a self-portrait that translated extraordinary possibilities into reality. Most postmodern leadership theories considered much more than the individual's development but rather the development of an organization as a whole with effective relationships and interactions within and outside of the organization as vital to successful endeavors.

According to Thompson (2015), our environment's broader ecology plays a significant role in how we interact with and interpret that very same environment. What Thompson termed *sense modalities* and *environmental matrices* work in concert with our understanding of the world and also help form that understanding. Clark and Chalmers (1998) shared insights that the mind is an extension of the environment. In the context of this research, based on the assumption that the genesis of EI is in the human mind, the environment in which the PM is operating should be accounted for when attempting to understand the outcome of a project operating in a holistic system (natural and built environments).

PMI, a globally recognized authority and professional certifying entity for PMs, defined project management as applying understanding, expertise, tools, and practices to achieve project objectives (PMI, 2017a). PMI established a unified guide to the project management body of knowledge, known as PMBOK®, in 1987, with six knowledge areas unique to project

management practices. These knowledge areas included managing scope, schedule, cost, procurement, communication, and quality. Project management was not a clear theory but has become more complicated as a social construct with multiple perspectives (Bresnen, 2016).

A critical component is the human side of project management, in which PMs must master the interpersonal skills of team building, team motivation, and effective conflict resolution. Morris (2013) stated that project management is more art than science, requiring a multi-dimensional view of project management theories for a more comprehensive understanding. The results presented in this research seem to support the claim of Morris; understanding one component of the process (here, outcomes) as it relates to human emotion may not be enough to fully capture and understand the connections lurking amongst the layers of human expectations, understanding of complex systems, and our limited ability to control unforeseen problems—all of these are facets of complex IT projects (Gutierrez & Friedman, 2005).

In project management, the PM is the project team leader whose responsibilities include driving the project from start to finish while ensuring that the project team achieves the planning objectives (PMI, 2017a). This role requires PMs to have practical project management skills and team management leadership competencies (Galvin et al., 2014). Navigating an organizational environment is an art form in attempting to secure the desired team members, bring them together as a capable team, and motivate them to deliver project objectives. The PM's leadership and soft people skills become paramount for PMs to be successful (Merrow & Nandurdikar, 2018).

Three prominent theoretical perspectives in the scholarly literature analyze complex information technology failures from a rationalist, process, and narrative perception (Baghizadeh

et al., 2020). The rationalist perspective considers projects to be a defined entity that is objective, measurable, with a predetermined end state. The rationalist perspective is the most prevalent view and measures project success to achieve the triple constraints of budget, schedule, and scope. Critics from the process perspective pointed out that the rationalist viewpoint misses understanding projects as socio-technical processes that develop over time in a non-deterministic and non-linear manner (Kim & Pan, 2006). Process theory introduces insights into the complexity of project failures caused by internal project issues (project management, technology, and decision making) and broader organizational processes that include upper-management, external vendors, and end-users. The third point of view comes from the narrative or social constructivist, who contend that one should look at a subjective meaning-making narrative that explains results as part of the complex nuances of the real-world interaction (Rhodes & Brown, 2005). The narrative aim is to interpret flaws in projects rather than discover causal factors. This study was designed through a rationalist perspective of clear objectives such as not realizing the triple constraints as defining failure or success. Looking at complex projects from a process or social constructionist viewpoint may show a more nuanced and more precise picture of why projects fail rather than just looking at the PM's competencies and precisely their EI traits.

While studies have shown a relationship between organizational success and EI and a few negligible studies showing EI and complex project success, this study failed to accept the alternative hypothesis, thus failing to lend support to that relationship based on previous work. The study instrument's narrow scope, dependability of the self-reporting process, or an anomaly of the sample may have all been contributing factors to the lack of explanatory power in the analysis presented herein. Expanding the research to a broader audience and examining other

factors such as organizational support, team competencies, and vendor relationships may shed more light on analyzing complex project outcomes.

Interpretation of the Findings

While the findings in this study did not find a significant relationship between EI traits and project success, it does not rule out the value of soft skills as measured by the TEIQue survey to be an essential factor in complex IT project outcomes. Some studies indicate a positive correlation between EI and project success (Trejo, 2016). Other studies presented a relationship as tenuous without including other mitigating factors such as organizational support, allocation of sufficient resources, and top management involvement (Ekrot, Rank, Kock, & Gemünden, 2016). Loufrani-Fedida and Missonier (2015) observed that focusing solely on the PM may be misguided without examining the organization's competencies.

IT projects are complex, multi-faceted endeavors that cannot be examined thoroughly through one agent's lens in the project. While soft skills have shown to be important in other facets of business operations (e.g., leadership), the same weight may not be inherently assigned to the concept of complex project success. Multi-modal approaches to either understanding the nuances of the individual or a broader approach to the drivers of success as a whole may be warranted in the search to uncover the connection between EI and IT project success. As an experienced PMP, the researcher has completed many complex projects successfully after learning the importance of organizational support, would not take on a project without full CEO or executive support, sufficient resources, and organizational buy-in. Employees in an organization may either sabotage the project intentionally or ignore it, thus contributing to failing IT projects. While acknowledging and understanding the value of personal and team

competencies, technical and soft skills, organizational support's significance should not be minimized.

Recommendations for Further Research

The limitations of this study, the narrow scope of the research may serve as an opportunity to broaden the research towards more insight into improving project outcomes. Self-reported surveys limited this study by PMs. Future studies may include qualitative design aspects and interview the customers gathering their perspective on project outcomes and reasons customers may share for failure or success. Also, interviewing the executives or project sponsors may indicate further understanding.

A qualitative approach that may help set the stage for a larger project could employ the use of phenomenology. While there are several ways to approach a phenomenological study, the primary purpose is to engage the participant in a dialogue that allows them to narrate their lived experiences, focused on the phenomenon under study (van Manen, 1990, 2016). Related to the present research, such a design would allow for emergent themes to be drawn from the interview narratives using software such as NVivo or Atlas Ti to perform content analysis. These themes could then be distilled into global themes (broader concepts) using Thematic Analysis Networks (Attride-Stirling, 2001). The goal of such a study could be twofold: (a) to understand better the most common themes that PMPs would identify as contributors to success, and (b) to allow for an easier path in building a survey instrument for either stand-alone use or use in conjunction with some other more advanced methods, such as expert elicitation or data reduction. The former of those two suggestions are discussed further below.

Expert elicitation is a process in which experts in a given field are provided a survey on a topic, and the results of that survey inform the analyst how to approach the next, more detailed,

level of questioning. Once this iterative process reaches a saturation point where the results no longer improve upon the previous level, the process has converged, and the final data set is analyzed and reported or used in further analysis. The most common and widely used expert elicitation method is known as the Analytic Hierarchy Process (AHP) (Saaty, 2000). The goal of AHP is to assist decision-makers in focusing on the best course of action for a set goal but can also be used to determine the best outcome given *a priori* knowledge of a system. An AHP analysis can produce useable weights added to a composite index for ranking or rating an outcome based on some set of inputs (Booysen, 2002; Nardo, Saisana, Saltelli, & Tarantola, 2008). Composite indices are commonly used to provide a quantitative perspective to data and information that may be mostly qualitative (Farrell & Hart, 1998).

Another family of methods focused on examining large and complex data sets is data reduction (or dimension reduction). Common approaches include principal components analysis (PCA), generalized discriminant analysis (GDA), and linear discriminant analysis (LDA). While related, these and others like them have unique assumptions and use. However, in general, each works to produce factor groups that contain multiple grouped collinear variables that explain the maximum amount of variance in a dataset using the least amount of factor groups (van der Maaten, Postma, & van den Herik, 2009). These methods group similar concepts into broader themes that explain particular characteristics of a large dataset. In the context of the present research, a large dataset could consist of hundreds or thousands of responses by PMPs to a 30- or 40-question survey on aspects of project success. Then, as one method, PCA could be executed to group those responses statistically (Kaiser, 1958). The resultant weights, called *eigenvectors* in PCA, can, like the results of AHP, serve as weights in a composite index focusing on ranking or rating project success based on any number of input variables (independents) with the

dependent being project success. Employing either AHP or a dimension reduction technique may serve to draw out relationships hidden in high-response survey datasets that would not otherwise be discoverable with correlation- or regression-based studies or purely qualitative studies.

Conclusions

The data results provided additional expansion of the body of knowledge base regarding the PM's EI and complex IT project outcomes. While the data showed no statistical correlation between PMPs EI and project outcomes, it does not rule out EI as an essential factor for the PM's competencies. The information from this study may be used to expand on and replicate parts of the study while also looking at other mediating factors such as organizational support, team competencies, and studying projects from a process or social constructivist perspective rather than a simple success or failure as a determinate.

The goal of this study was to help organizational leaders with solutions that might improve project outcomes. This data suggests there may be additional factors to success than the competencies of the PM. Further research into the areas that organizations can improve within and without may shed more insight for improvement. Ultimately, the findings provide organizational leaders information that can help them understand the complexity and relationships in IT projects that should be considered along with the competencies of a PM.

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APPENDIX A. Project Outcome Questions

Instructions: Please answer each statement below by putting a circle around the number that best reflects your degree of agreement or disagreement with that statement. Try to answer as accurately as possible. There are five possible responses to each statement ranging from 'Strongly Disagree' (number 0) to 'Strongly Agree' (number 4).

Score	Description	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1	The project met the triple constraints of scope, budget, and schedule	0	1	2	3	4
2	I consider the project a success	0	1	2	3	4
3	The customer considered the project a success	0	1	2	3	5