EXAMINATION OF THE RELATIONSHIP BETWEEN EXTERNAL ENVIRONMENTAL CONDITIONS AND CONSTRUCTION PROJECT FAILURES IN COUNTRIES OF NORTHERN AFRICA.

by

Rex W. Mols

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Doctoral Study Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Business Administration

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Liberty University, School of Business

FEBRUARY 2021
Abstract

The construction industry is an essential and supportive pillar of national economies in Northern Africa making construction project management a dynamic arena. Construction project success is dependent on how well project managers recognize and manage project constraints versus negative risk impacts. The purpose of this qualitative research was to explore and describe the impacts between external environmental conditions and construction project failures in countries of Northern Africa. Data was sourced from construction project managers that operate within this region. Data collected focuses on the interdependencies between negative risk impacts from external environmental conditions and construction project failures. An analysis of the collected data reveals emergent themes, influence drivers as well as risk management approaches. The identified emergent themes and influence drivers could assist construction project managers with managing negative risks by selecting optimal risk mitigation approaches. Successfully implementing construction projects in Northern Africa may assist firms to better allocate funds and execute strategies to strengthen these national economies.

Keywords: construction project management, project failure, external environmental conditions, influence driver, negative risk, risk management
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Approval

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Acknowledgements

I thank God for this opportunity and for His grace, love and mercy experienced throughout this process. To my wife and best friend, you never left my side as I struggled through this doctorate program. Your work ethic and dedication to our shared goal held–fast during the many hours of editing and proofreading. Without your unfailing understanding and encouragement, this study would not have been accomplished. Finally, thank you to all those friends and family members that listened, sympathized, cheered me on, and held me up in prayer.
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Section 1: Foundation of the Study

Section one provides the reader with an overview of the foundational elements of the research presented. There are ten subsections to this portion of the research. These include the following: 1) background of the problem, 2) problem statement, 3) purpose statement, 4) nature of the study, 5) research questions, 6) conceptual framework, 7) definition of terms, 8) assumptions, limitations and delimitations, 9) significance of the study, and 10) literature review. Providing this information in this format allows the reader to draw a direct link to the foundational elements of the research project.

Background of the Problem

According to the Project Management Institute (2017), project success is individualistic because all projects are unique with varying requirements. Successful project management is the process of developing best practices to accomplish projects within constraints, which are on schedule, within the scope, and budget (Gray & Larson, 2018). Managing projects successfully involves the process of identifying and managing risk events. Project managers utilize interdependent considerations to adapt core principles to balance constraints that steer construction projects toward success. Gunduz and Yahya (2015) examined and determined several critical success influencers for the completion of construction projects. The research led to identifying empirical evidence to increase construction project success rates. The results of the research conducted by Gunduz and Yahya (2015) suggested that there are significant variances between how project managers obtain an understanding of project risks and how well negative risks are managed.
Problem Statement

The general problem to be addressed was the high failure rates in construction projects resulting from external environmental conditions. According to Militaru et al. (2016), construction projects encountered considerable schedule delays, cost overruns, and failed to provide strategic benefits to the organization. These construction projects were often terminated during execution or abandoned after completion. When these construction projects failed, it became another statistic of the billions of US dollars lost each year on these endeavors (Kardes et al., 2013). Vereen et al. (2016) posited that common practice was to describe high-level risks within the project charter, while an in-depth analysis of risk was conducted during the planning process. These high-level risks were often identified by the project sponsor, which may have viewed risk differently than the executing agent. Prater et al. (2017) suggested that risks may be optimistic from the perspective of the project sponsor. The research established that current risk management approaches lacked the ability to adequately predict potential risks before the initiation of a project in the region of Northern Africa. Therefore, what is needed is a more in-depth risk assessment of the external environment to be conducted by the executing firm to identify risks associated with construction projects in the region of Northern Africa. This leads to the specific problem to be addressed by this research. The specific problem to be addressed was that project failures within construction projects located in Northern Africa are substantially elevated when compared to other regions.

Purpose Statement

The purpose of this qualitative case study was to explore and describe the impacts between external environmental conditions and construction project failures in countries of Northern Africa. The specific problem was explored through an in-depth study of external
environmental conditions. The effects on construction projects from these external environmental conditions establish contextual descriptions. These contextual descriptions reveal the external environmental conditions that influence construction project outcomes in Northern Africa. The information gleaned from this study enhances the understanding of the negative risks in Northern Africa and construction projects, which expands on the body of knowledge of project management.

Studies implied that construction projects in Northern Africa have dynamic situational occurrences in which potential negative risks materialize anytime during the project lifecycle (Damkjaer & Taylor, 2017; Moawad et al., 2016). According to Vereen et al. (2016), risk management on typical construction projects involved processes that identify, evaluate, and manage potential influencers that impact cost, schedule, and scope. Previous research conducted by Qazi et al. (2016), suggested that excluding any risk can lead to adverse project outcomes that affect the project constraints. In that study, consideration of external market conditions and country related complexities related to the environment were not determined to be relevant. Risk identification, evaluation, and management processes must not be limited to a single phase. An iterative process should be implemented and exercised throughout the construction project lifecycle to identify and manage negative risk influencers effectively.

**Nature of the Study**

This study utilized a qualitative method with a bound and collective case study design (Creswell & Poth, 2018). The case study design was adapted from social sciences and describes specific cases that illuminate the issue of negative risk considerations, which was the focus of this study. The use of a case study design provided an effective means to develop in-depth accounts useful for the analysis of multiple case examples (Bartlett & Vavrus, 2017). Data
collection for case studies include the utilization of multiple sources that are bound by time and location. The sources of data collection included literature reviews, surveys, and interviews (Creswell & Poth, 2018). The strategy for analyzing selected case studies included concentrated descriptions of collected data that develop emergent themes related to the construction project lifecycle (Bartlett & Vavrus, 2017).

**Discussion of Method.**

The quantitative method relies on closed-ended questions (Tunarosa & Glynn, 2017). The qualitative approach relies on opened-ended questions. The quantitative approach collects data utilizing a rigid objective approach that does not consider the influence drivers found in subjective data. The use of open-ended questions used in the qualitative method allows for the consideration of subjective data. The result of utilizing open-ended questions adds depth to the research conclusions. The mixed-method approach combines quantitative and qualitative research approaches. The mixed-method approach requires the researcher to collect both objective and subjective data to explore the problem (Tunarosa & Glynn, 2017). As a result, the mixed method was avoided because the rigidity of objective data collection would not apply to this research. This consideration process resulted in the qualitative approach being selected for the research.

**Discussion of Design.**

Four qualitative research design types were considered for this research. The phenomenology is the study of a defined phenomenon (Creswell & Poth, 2018). It is a way of describing something that exists as an integral part of the world. The phenomenology method was not used for this study because the research participants must be able to articulate their thoughts and feelings about the experience being studied concerning the concept. Due to
language barriers, perception, embarrassment, and other influencing factors, the collection of data could be challenging. The Grounded theory design is the construct of new theory through the collection and analysis of available data about a phenomenon. The Grounded theory expands beyond phenomenology because the conclusions that materialize are considered new knowledge and are utilized to develop and establish new theories on a particular phenomenon. In the Grounded theory, the influence of the researcher could lead to false assumptions and thus obscure the data construction and interpretation. The ethnography method is the process of capturing a portrait of an identified culture-sharing group in a descriptive study. Ethnographic research occurs in natural settings for long durations, which leads to geophysical challenges for the researcher. The case study design describes specific cases that illuminate the issue. Data collection for case studies include the utilization of multiple sources that are bound by time and location. The challenge of the case study was that the quintain must be identified/defined at the beginning of the research (Stake, 2006). In this research, the quintain was defined as the impacts between external environmental conditions and construction project failures in countries of Northern Africa.

**Summary of the nature of the study.**

The study utilized a qualitative method with a bound and collective case study design (Creswell & Poth, 2018). The use of open-ended questions used in the qualitative method allowed for the consideration of subjective data. The use of a case study design provided an effective means to develop in-depth accounts useful for the analysis of multiple case examples (Bartlett & Vavrus, 2017). The strategy for analyzing selected case studies included concentrated descriptions of collected data that developed emergent themes related to the area of focus.
Research Questions

- RQ1. What are the external environmental conditions that negatively impact construction projects in Northern Africa?
- SQ1. How do external environmental conditions negatively impact construction projects in Northern Africa?
- SQ2. How do project managers manage negative external environmental conditions in the North African region?

Conceptual Framework

The conceptual framework served the purpose of offering a written and visual representation of the key concepts studied. The three concepts studied in this research included 1) Traditional Project Triangle, 2) DeLone and McLean, and 3) Time-dependent success measures. This section also includes the presumed relationships among the selected concepts. Finally, a summary highlights the importance of each concept.

Concept 1: Traditional Project Triangle.

Concept number one was developed in the 1950s and is considered the Traditional Project Triangle (also known as the Iron Triangle). The Traditional Project Triangle concept emphasizes that project success is associated with delivering an endeavor with the defined scope, on time, and within budget (Pollack et al., 2018). This suggests that construction project success is related to the project manager’s ability to identify, analyze, and plan risk responses to potential negative project influencers that could impact the scope, time, and budget constraints. The traditional project triangle concept established the basis for the data collection on the causes of construction project failure in Northern Africa and was compared to the DeLone and McLean and Time-dependent concepts. Applying the Traditional Project Triangle concept to this
qualitative research revealed the negative risk influencers that adversely impact construction projects.

**Concept 2: DeLone and McLean.**

Concept number two was adapted from DeLone and McLean’s (2003) research. The DeLone and McLean model focuses on quality and functionality as success determining factors on projects. Baccarini (1999) suggested that projects could be over budget, behind schedule, or both as long as the final deliverable satisfied the intended need of the customer. Baccarini (1999) posited that project success was an amalgamation of good project management practices and delivery success. The DeLone and McLean concept was developed in response to research conducted by Baccarini (1999). In that research, Baccarini (1999) posited that delivery success referred to meeting the intended use of the project and satisfied the customer.

The DeLone and McLean (2003) concept suggested that a project begins with well-defined requirements. The project manager was tasked with determining the project influencers that could negatively impact the success of the project. This required risk management techniques to manage the work, deliver a project that met the intended use, and satisfied the customer. The DeLone and McLean (2003) project management concept established the basis for the data collection on the causes of construction project failure in Northern Africa and was compared to the Traditional Project Triangle and Time-dependent concepts. Applying the DeLone and McLean concept to this qualitative research revealed the negative risk influencers that adversely impacted construction projects.

**Concept 3: Time-dependent.**

Concept number three was adapted from Shenhar et al. (2002). Shenhar et al. (2002) explained that success metrics based on the project schedule, budget, and scope were misleading
performance indicators. Shenhar et al. (2002) proposed a multifaceted conceptual framework that measured project success on four levels. These levels included project efficacy, customer impact, business success, and preparation for the future. Project efficacy is level one and measured performance during project execution and completion similar to the Traditional Project Triangle concept. Customer impact is level two and measured performance after the project was delivered to the customer similar to the DeLone and McLean concept. Business success is level three and measured performance after several years to ensure project profitability. Preparation for the future is level four and measured performance after five or more years to ensure project sustainability. This suggested that risk management was a more holistic approach that extended beyond project completion. The Time-dependent concept established the basis for the data collection on the causes of construction project failure in Northern Africa and was compared to the Traditional Project Triangle and DeLone and McLean concepts. Applying the Time-dependent concept to this qualitative research revealed the negative risk influencers that adversely impact construction projects.

**Discussion of relationships between concepts.**

The three concepts selected for this research were employed in developing an understanding of construction project success. The concepts can be utilized together or independently to develop planning initiatives by revealing influential drivers that adversely impact construction projects. These concepts used together could triangulate collected data to support risk management techniques. The result leads to improved decision-making abilities and a higher probability of successful construction project completion.
Figure 1. Relationship between concepts.

Summary of the conceptual framework.

Concept number one was developed in the 1950s and is considered the Traditional Project Triangle that suggests success is measured on whether a project is delivered with the defined scope, on time, and within budget (Pollack et al., 2018). Concept number two was adapted from DeLone and McLean’s (2003) research, which focuses on the quality and functionality of the project deliverables. DeLone and McLean (2003) defined project functionality and quality as how well the project deliverables met the intended requirement and satisfied the customer. Concept three was adapted from Shenhar et al. (2002) research that
developed a multifaceted conceptual framework that measured project success on four time
dependent levels. The four levels of the Time-dependent concept include project efficiency,
customer impact, business success, and preparation for the future. In all three concepts, external
environmental conditions have the potential to negatively impact the outcome of a project within
these three concepts. Therefore, risk management is a crucial facet in ensuring construction
project success.

**Definition of Terms**

Baseline: The original project plan that includes approved changes. Typically utilized
with a modifier (cost baseline, schedule baseline, performance baseline) (Project Management
Institute, 2017).

Contingency: The development of a documented plan that lists and identifies alternative
execution strategies to be utilized in the event of a risk occurrence.

External environmental conditions: - A group of factors or conditions that are outside of
the project, but affect it to varying degrees (Liu et al., 2019).

Lifecycle: Refers to the project life span from beginning to end. This consists of five
phases: 1) initiation, 2) planning, 3) execution, 4) monitoring/controlling, and 5) closeout
(Project Management Institute, 2017).

Project: A temporary and unique endeavor undertaken to develop and create a new
product, service, or result with a defined schedule and budget. (Project Management Institute,
2017).

Project artifacts: The tangible by-products of undertaking a project (e.g., performance
documents, project charter, or designs).
Project Delivery Team: The team members of a project that directly manage project activities through each lifecycle phase (Project Management Institute, 2017).

Project Management: The act of applying knowledge, skills, tools, and techniques to project activities to meet the project requirements.

Risk: An uncertain event or condition that could have negative or positive effects on project deliverables.

Risk management: The actions executed to manage negative and positive risk events.

Stakeholder: The individuals and firms that may participate in the project or may be affected by project activities.

Assumptions, Limitations, Delimitations

This section provides the researcher’s assumptions, limitations, and delimitations associated with the research. The assumptions are things that are generally accepted to be accurate or at least plausible. The limitations are the potential weaknesses within the research that are outside the control of the researcher. The delimitations are the boundaries set within the study that are within the control of the researcher.

Assumptions.

Assumptions include how the construction project was approached by the project delivery team and where the construction projects fit into this research. It was assumed that the project delivery team involved in undertaking construction projects in Northern Africa were endeavoring to accomplish the construction project within constraints. This assumed that the project delivery team strived to accomplish the project using traditional project management practices to maintain schedule, budget, and scope. The utilization of traditional project management practices assumption means that the professionals undertaking the endeavor were
motivated to complete the construction project successfully. It was assumed that project delivery teams utilized risk management to lessen negative impacts while taking advantage of positive impacts on the construction project. It was also assumed that project delivery teams utilized principles established by the Project Management Institute (2017) versus other organizations such as Prince2.

Common causes of construction project failures included ineffective and unrealistic planning by the project delivery team (Prater et al., 2017). It was assumed that the common construction project failures discovered in this research had related external environmental conditions that were overlooked during the project lifecycle processes. The final assumption was that the outcome of this research can be applied to both commercial and non-profit construction projects.

Limitations.

Project management is a business practice that is utilized throughout several industries. The Project Management Institute (2017) principles are generally accepted and utilized throughout the world; this research captured a small sampling. An additional limitation of this research was the limited amount of previous research conducted on construction projects in Northern Africa. Another limitation of this research was the access to participants within this region. Accessing project managers of past construction projects within the region could limit data collection.

Delimitations.

The scope of this research investigated construction projects implemented in Northern Africa. The research only considered commercial, non-government organizational and
government organizational construction projects in Northern Africa. All other projects were excluded, such as private or residential construction.

**Significance of the Study**

The significance of the study portion of the research introduces the reader to the implications of the topic studied. The first subsection provides an introduction to the existence of the gap in the current body of knowledge and how this gap could be reduced. The second subsection offers the implications for biblical integration. The third subsection provides the relationship to the field of project management. These subsections are summarized at the end of the section.

**Reduction of Gaps.**

The Project Management Institute (2017) established standardized processes to initiate, plan, execute, monitor and control, and close-out projects, but process implementation is unique among all projects. That stated, many projects are not delivered successfully. For construction projects, the failure rate is higher when compared to other types of projects (Gunduz & Yahya, 2015). Qazi et al. (2016) posited that construction projects were influenced by several external environmental conditions, have a higher level of complexity, and required more individual/specialized disciplines than other projects, which contributed to the higher failure rates.

This suggests there is a gap in the research about why construction projects fail. New approaches are needed to manage construction projects to overcome these higher failure rates. The research findings provided reduces the gap in the body of knowledge by identifying common external environmental conditions and influence drivers that adversely impacted construction project success in Northern Africa. Revealing the external environmental conditions
and influence drivers that contributed to construction project failure in Northern Africa allows for the development and utilization of risk management approaches to reduce negative risk impacts. The knowledge gleaned assists firms and project managers of construction projects to deliver projects successfully.

**Implications for Biblical Integration.**

There are several projects portrayed throughout the Bible. Firstly, however, it must be stated that God is not only a creator, but He is the Creator. As Creator, God demonstrates orderly processes by creating the world with a scope of work and a schedule of six days (Gen. 1:1-31, New Living Translation). Additionally, He created man in His image. In these first examples, God provides a template for the perfect projects and how a project manager should govern a project.

The fall of man and the curses that followed affect all things in Creation (Genesis 3). Romans 8:22 acknowledges that even the earth cries out in pain. In mankind’s fallen state, construction projects are implemented with flaws and subject to these adverse external environmental conditions. For instance, Mark 6:45-48 is the account of Christ instructing and His disciples obeying. The account cautions against the wrong thinking that doing right equals an easy and perfect outcome. Wrong thinking takes many forms and will impact all endeavors. The Tower of Babel is an example of a prideful attempt to reach the heavens, which ends with failure (Gen 11:1-9). Following God’s instructions, such as the story of Noah and the Ark (Gen 1:9-22), it can be shown that it is still possible to deliver a project on schedule and within scope. In another example of a successfully implemented project following God’s instruction, is the delivery of the construction for the Tabernacle (Exodus 25-31). While following God’s will and
paths do not always guarantee success, it will increase the probability of a successful project (Matthew 6:33).

In the New Testament, individual guidance is provided to would-be project managers. This guidance takes form in Matt 5:17-20, meeting requirements (laws and regulations), Matt 6:24, working one package at a time, Matt 10:5-13, providing clear instructions and Matt 7:24-27, building in the correct location. Luke 14:28-29, provides a more direct guide about costs by stating, “For who would begin construction of a building without first calculating the cost to see if there is enough money to finish it? Otherwise, you might complete only the foundation before running out of money, and then everyone would laugh at you”.

The lessons gleaned from Biblical integration are several within these passages. In the broad strokes, God is the example that we are to pattern after and it is He that we ultimately work for. He sees beyond our works to weigh our hearts and motives. In the more detailed strokes, establish the project outline by identifying and defining the scope, schedule, budget, and influential factors. Define the roles and responsibilities within the project delivery team and carefully select and empower the members. Be diligent in all things. Communicate the plans with precise instructions in such a way that quality and functionality are enhanced. Develop an environment where new ideas and feedback are welcomed. Build from and incorporate learned lessons from previous projects and celebrate project deliverables and closure.

**Relationship to Field of Study.**

Project managers play a significant role in undertaking construction projects. At every phase in the project lifecycle, construction project managers must understand that no project is without uncertainty or risks (Project Management Institute, 2017). The better a construction project manager is at identifying, planning for, and reacting to risk directly impacts the project
outcomes. According to Qazi et al. (2016), the ability to manage a variety of risks was essential to completing a construction project successfully. Examining the relationship between external environmental conditions and construction project failures in countries of Northern Africa assists with revealing new insights that influence project success and improves the construction project manager’s skillsets at managing risks effectively.

**Summary of the significance of the study.**

The research reduces the gap in the current body of knowledge by offering a new approach to identifying common external environmental conditions that influence construction project failures. Revealing these common external environmental conditions contributes to the body of knowledge by developing the reader’s ability to utilize enhanced risk management practices. The second subsection offered the implications for biblical integration. The lessons gleaned from Biblical integration are several throughout the passages. For instance, determining project objectives, defining roles and responsibilities, being diligent, and the importance of communication. All of these lessons assist with managing project risks. The third subsection provided the relationship to the field of construction project management. Research suggests that the better a construction project manager is at identifying, planning for, and reacting to negative risk assisted to improve project outcomes. Examining the relationship between external environmental conditions and construction project failures revealed new insights that influence project success and improve the project manager’s skill at managing risks.

**A Review of the Professional and Academic Literature**

Compiled is a literature review that thoroughly examines the relationship between project management and the importance of understanding the environmental conditions and construction project failures. This literature review will define the region of Northern Africa, explain the
concept of project management, and describe the concepts from the conceptual framework utilized to delineate both failed and successful projects. These concepts from the conceptual framework will be compared and contrasted in the following sections for further exploration. The compiled literature provides the reader with a background of the current data on the topic of research.

**Northern Africa**

North Africa is defined as the countries on the Northern tip of the continent of Africa that borders the Mediterranean Sea (Cassarino, 2017). The countries that comprise Northern Africa include Algeria, Egypt, Libya, Morocco, and Tunisia. The countries represent the Southern gateway into Europe. These countries also are a Western gateway into the Middle East with various shipping ports where resources are exported throughout the world. According to Coniglio et al. (2015), the geographic location combined with a large and cheap labor force means that firms throughout the world are interested in investing billions of dollars into the region in the form of construction projects. This is a large contributor to world Gross Domestic Product (GDP) and has a significant multiplier effect on regional and global economies (Smith, 2016).

The construction market continues to increase with approximately $473 billion in investments throughout Africa (African Review, 2017). The Africa Construction Trends Report by Deloitte (2018) tracked projects of greater than $50 million in value. According to Deloitte (2018), the Northern region of Africa represents 22.6% of construction projects and 31.5% in terms of US dollar value on the continent. This is a 172.5% increase in new construction projects over $50 million, with an increased value of 92.3% compared to the 2017 data (Deloitte, 2018). These construction projects include transport (such as rail and shipping ports), oil/gas (drilling,
mining, and refineries), energy/power (solar and steam plants), and water infrastructure (Deloitte, 2018).

**Algeria.** The People’s Democratic Republic of Algeria is located in the Northwestern region of North Africa. According to Algeria (2019), Algeria is the largest country in Africa, with a landmass of 2,381,741 km² (1,479,945 mi²). The current population of Algeria is approximately 40.6 million as of 2019. Lefèvre (2017) reported that Algeria is a primary producer of oil and gas in Africa. The hydrocarbon production sector accounts for approximately 94% of government revenue and nearly all exports (Lefèvre, 2017). The state-run energy industry will invest $2.5 billion in construction projects over the next five years amid falling oil prices to diversify exports (Lefèvre, 2017).

**Egypt.** The Arab Republic of Egypt is located in the Northeastern region of North Africa (Nations Online, n.d.-a). The total land area is 995,450 km² (618,543 mi²), with a current population of 90.2 million as of 2017. According to Marzouk and Gaid (2018), the Egyptian construction sector consists of many new mega project initiatives such as the Suez Canal tunnels, high capacity power plants, renewable energy research and development projects, infrastructure, building a new capital office, and Northern coastal tourism facilities. These investments represent approximately $552 million (African Development Bank, 2020).

**Libya.** Libya is located in the North central region of Africa. The land area is calculated as approximately 1,093,320 km² (679,358 mi²; World Population Review, n.d.). The population of Libya is estimated at 6.5 million. Libya is planning to double oil and gas production (Libya, 2019). According to Omran and Abdulrahim (2015), the construction sector cannot meet the national demand. Projects include airports, shipping ports, railways, and roads that need to be
constructed or upgraded. These projects represent approximately $2.6 billion (Libyaholdings, 2012).

**Morocco.** Morocco is located in the Northwestern region of Africa. The current population of Morocco is estimated at 36.5 million as of 2019 (Worldometer, 2019a). The total land area is calculated at 446,300 km² (277,318 mi²). Global Data (2019) forecasts that infrastructure construction projects will increase by 2.5% in nominal terms. To remove traffic congestion in the country, the government is focusing on construction projects that enhance transport infrastructures such as shipping ports, railways, airports, and roads. Forecasts suggest that the government is expected to invest $10 billion into high-tech city development projects over the next ten years (Global Data, 2019).

**Tunisia.** Tunisia is located in the North central region of Africa. The current population of Tunisia is estimated at 11.6 million (Worldometer, 2019b). The total land area is 155,360 km² (96,536 mi²). The government is targeting a goal of generating 30% of electricity from renewable energy by 2030 (International Trade Administration, 2019). One example is that the government has awarded 12 solar construction projects. Additionally, the government is working with investors to develop infrastructure, science, and technology construction projects. These construction projects represent approximately $15 billion (International Trade Administration, 2019).

**Project Management**

A project is defined by the Project Management Institute (2017) as a temporary endeavor that consists of a defined schedule, scope, and resources. A project is considered unique as it is not a part of routine operations. Project management is defined as the application of knowledge, skills, tools, and techniques to achieve a singular goal (Project Management Institute, 2017).
Formal project management began to emerge as a distinct profession in 1969 with the establishment of the Project Management Institute (Seymour & Hussein, 2014). However, project management has been utilized liberally since Biblical times, such as Noah’s construction of the Ark:

   So make yourself an Ark of cypress wood; make rooms in it and coat it with pitch inside and out. This is how you are to build it: The Ark is to be three hundred cubits long, fifty cubits wide and thirty cubits high. Make a roof for it, leaving below the roof an opening one cubit high all around. Put a door in the side of the Ark and make lower, middle and upper decks Gen 6:14–16, New International Version).

The position of a project manager is distinctive from those of functional or operational managers (Project Management Institute, 2017). A functional manager focuses on providing management oversight of functional or business units. Operational managers are responsible for ensuring that business processes are operating efficiently. Project managers lead project delivery teams to accomplish project objectives and meet stakeholder expectations.

According to Zwikael et al. (2019), the project manager’s primary responsibility was to balance the competing project constraints using available resources. Project managers utilize extensive communicative ways and means between the project sponsor, project delivery team members, and stakeholders. These ways and means include providing instruction and presenting the definition of a successful project. Zuo et al. (2018) supported this description by suggesting that project managers utilize interpersonal skills to manage and influence individuals to balance the conflicting and competing goals of project stakeholders. According to the Project Management Institute (2017), the top 2% of project managers distinguished themselves by
demonstrating superior relationship and communicative skills, while exhibiting a positive attitude throughout the project lifecycle.

**Project Lifecycle.** There are five lifecycle phases of a project that must be managed (Project Management Institute, 2017). The five lifecycle phases provide a high-level view of a project. The project lifecycle phases include 1) initiating, 2) planning, 3) executing, 4) monitoring and controlling, and 5) close-out. According to Zare Ravasan and Mansouri (2016), the term ‘phase’ suggested that the project lifecycle occurs in chronological order from initiation to close-out, in practice, these can be performed anytime during the project. For instance, when a project encounters a change/modification during the monitoring and control phase, a project manager would proceed back to the planning phase.

**Initiation.** The initiation phase is the first process in the project lifecycle. The initiation phase involves the steps needed to develop and start a new project or start a new phase of an ongoing project (Project Management Institute, 2017). The purpose of this process group is to align stakeholder expectations with the project deliverables. This is accomplished by developing a business case and scope statement with stakeholder involvement. According to Økland et al. (2018), the result ensures a shared understanding of the project deliverables.

**Planning.** The planning phase is comprised of the processes that develop and establish a complete management plan of the project effort (Ibadov, 2018). The planning phase includes defining and refining the deliverables and developing the steps needed to achieve the project scope. This develops into a project management plan that formally establishes the ways and means in which the project will be undertaken while maintaining constraints (Jeong et al., 2015). The project management plan defines how the project will be planned, executed, monitored, controlled, and closed out. The project management plan serves as a communication vehicle to
ensure that critical stakeholders share an understanding of the entire project. As the project progresses, the project management plan is progressively elaborated upon by updates.

**Execution.** The executing phase contains all processes performed to accomplish the defined work within the project. The executing phase requires the coordination of resources, managing communication, and performing the sequence of activities defined in the project management plan. Iyer and Banerjee (2016) suggested this was vital because a large portion of the project budget, resources, and time is consumed in performing the execution phase. Executing the project by following the plan ensures the deliverables and objectives have a higher probability of achieving performance measures that lead to project success (Hellström et al., 2016).

**Monitoring and controlling.** The monitoring and controlling phase includes all the processes related to tracking, reviewing, and regulating the progress and performance of the project (Project Management Institute, 2017). The monitoring and controlling phase is used to identify potential areas in which changes to the project plan are needed. The monitoring portion of this phase involves the collection of project performance data, developing performance measures, and reporting performance information to stakeholders (Iyer & Banerjee, 2016). The controlling portion of this phase involves analyzing the actual to the planned performance, determining variances, evaluating trends, and recommending the appropriate corrective action (Zheng et al., 2019). The monitoring and controlling phase offers the benefit of tracking project performance and analysis of performance at regular intervals (Zare Ravasan & Mansouri, 2016). The phase also allows for changes to be accomplished to correct variances from the project management plan.
**Close-out.** The close-out phase includes the process of formally completing or closing a project, project phase/portion, or contract (Project Management Institute, 2017). The close-out phase is used to verify that the defined processes were accomplished and formally establishes that the project or project phase/portion is done. The benefit offered by the close-out phase ensures that the phases/portions, projects, and contracts are closed out according to organizational policy. The close-out phase is utilized to address early project close-out in the event of failed/aborted projects or canceled projects.

**Traditional Project Triangle**

The Traditional Project Triangle focuses on applying project management knowledge, skills, tools, and techniques to maintain scope, schedule, and cost (Project Management Institute, 2017). Larson and Gray (2018) defined successful project management as planning and executing a defined project scope, project schedule, and cost while managing project risks. Davis (2017) suggested that achieving defined project goals within an allotted schedule, budget, and meeting performance criteria upon project completion are what drives project management. Pollack et al. (2018) posited that the concept of managing constraints was a fundamental aspect of how project managers, firms, and customers understand project success. This includes whether the project was delivered on time, within budget, and to an agreed-upon scope. These metrics, also known as the Triple Constraints, has become a standard benchmark for determining project success (Pinto, 2010).

Kabirifar and Mojtahedi (2019) postulated that time, cost, and scope were the three most essential measures of success in a construction project. The time, cost, and scope constraints influence the entire project lifecycle from the initiation through the close-out. Managing the equilibrium across these constraints regarding construction project success is considered critical
during execution and project performance objectives established by the stakeholders. Stakeholders are significantly affected by the timeline and costs of construction projects when these performance measures are not achieved (Gebrehiwet & Luo, 2018; Mabelo & Sunjka, 2017).

According to Hanak and Korytarova (2018), there were numerous potential risks to influence project success. These are related to missed milestones and cost overruns. The influences included logical issues, accidents, fluctuation of price/exchange rates, material/resource inadequacy, and weather (Chang et al., 2018). Blomquist et al. (2016) researched construction project success versus the knowledge of the project manager. It was concluded that various influences could be correlated against the areas of knowledge and success. These areas of knowledge consisted of the scope, time, cost, and quality of the construction project, procurement, risk, labor, and communication management (Hanak & Korytarova, 2018).

**Scope.** Fageha and Abinu (2014) defined project scope as the process of detailing the physical work needed to meet a business need that is identified and articulated in such a way as to facilitate project execution. This gives the project team a full understanding of what needs to be delivered. The scope of work also assists the project manager and project delivery team in establishing management control systems. Fageha and Abinu (2014) argued that having a complete understanding of the project deliverables was significant to construction.

Banda and Pretorius (2016) suggested that there is a correlation between the level of project scope definition and the successful completion of projects. The research concluded that projects with well-defined scopes tended to exhibit better overall performance than poorly-defined projects. Derenskaya (2018) supported this claim by stating that establishing the
realization of necessary work ensured the successful accomplishment of a project. Not utilizing project management techniques such as scope management would be considered a waste of financial and human resources (Mougouei, 2017).

Mabelo and Sunjka (2017) claimed that communication failures among critical stakeholders during the planning phase impacted construction projects by introducing conflicting requirements. These communication failures led to deviations and deficiencies in the project scope that were discovered in the execution, monitoring and controlling and close-out phases. Correction of these deviations and deficient work influenced time and cost. In some cases, deviations and deficient work led to the abandonment of the construction project.

**Time.** The Project Management Institute (2017) states that a project manager must develop and establish specific procedures to govern a project schedule. This is accomplished by 1) defining work activities that must be accomplished to generate each project deliverable, 2) determining work activities that are connected, 3) estimating the duration for each work activity, 4) developing an overall project schedule based on the considerations of procedural steps one through three, and 5) monitoring and controlling the project schedule during the project lifecycle. According to Chin and Hamid (2015), project schedule management was a vital role of the project manager to ensure deliverables were provided on time. Sanchez et al. (2017) supported this position by suggesting that the project manager was responsible for delivering project outputs on time, within the budget, and according to scope.

Hanak and Korytarova (2018) suggested that construction was a labor-intensive industry. The project manager’s time management ability can assist in controlling labor costs. Managing time means coordinating work that allowed the work to progress effectively in an orderly flow from beginning to close-out (Iyer & Banerjee, 2016). Delays influence the overall duration of the
construction project. For instance, when groups of workers were required to wait until a specific
task was completed, delays were occurred. It was noted that when construction projects are not
delivered within the allocated time, a Time-dependent contract was in danger of being terminated
because of a breach of contract. Based on research by Zheng et al. (2019), the most common
influencer of poor project performance was time management.

Cost. The project costs include planning, estimating, accounting for costs, financing,
funding, and monitoring and controlling financial transactions, during the entire project (Project
Management Institute, 2017). Smith (2016) postulated that budgeting for construction projects
was a multidimensional endeavor that required careful consideration. Sanchez et al. (2017)
supported these conclusions and provided additional that determined that a project manager must
communicate and lead during the process of correctly identifying and defining the context of
conditions associated with developing budgets.

Gebrehiwet and Luo (2018) investigated the influence drivers that affected cost in
construction projects from the perspectives of contractors. Gebrehiwet and Luo (2018) concluded
the common external environmental condition associated with increased costs had five influence
drivers. The five influence drivers that increased costs included project financing, fluctuation in
currency exchange rates, material costs, contract management, and other competitors
(Gebrehiwet & Luo, 2018). Müllner (2017) developed three external environmental conditions of
cost overrun in the foreign construction markets. These external environmental conditions
included contractor financial management issues, material price variations, and poor site
supervision (Müllner, 2017). Jung et al. (2017) investigated the causes of elevated costs in the
international construction markets. A questionnaire was developed and employed to determine
influencers that caused cost overruns and delays. Jung et al. (2017) determined that labor and
material costs, financing, poor contract management, and changes in exchange rates were the primary drivers. A study in the same region, supported this determination. Omotayo et al. (2018) posited that kickbacks, fraudulent practices, material, and labor costs influenced project outcomes in the Nigerian construction markets.

**Project Failures**

Research conducted by Militaru et al. (2016) suggested that construction projects within environments such as Northern Africa encountered considerable time and cost overruns and fail to provide strategic benefits to firms. These construction projects are often terminated during execution or abandoned after completion. Kardes et al. (2013) postulated that when these construction projects failed, it became another statistic of the billions of US dollars lost each year on these endeavors.

The research conducted by Militaru et al. (2016) suggested that construction project failure were defined by a project not achieving one of three constraints. The constraints consisted of construction project time/schedule, cost/budget, or not meeting the intended purpose of the scope of work. Militaru et al. (2016) and Renault et al. (2018) suggested that failures are from a lack of risk management in the construction industry. The following sections define the impacts from negative risk influencers. The common negative risk impacts are considered: scope creep, schedule delays, and budget overruns.

**Scope creep.** According to Teye Amoatey and Anson (2017), scope creep was a primary negative risk impact that contributed to high failure rates on construction projects. Larson and Larson (2009) defined scope creep as the addition of features to the project not authorized by the original agreement. The Project Management Institute (2017) described scope creep as unauthorized changes to features or functionality of a project without consideration to time,
costs, or schedule impacts. Larson and Larson (2009) continued by providing five common reasons for scope creep. The five common reasons for scope creep included: 1) ambiguous or unrefined scope definition, 2) lack of formal scope management, 3) inconsistent process for collecting project requirements, 4) lack of stakeholder involvement, and 5) project duration. Teye Amoatey and Anson (2017) identified the following caused scope creep 1) a lack of clear scope definition, 2) attempts by the project delivery team to improve the project, and 3) complexity. These reasons for scope creep are explored further in the following sections.

Project scopes can be ambiguous, unclear on requirements/needs, and can be contradictory (Larson & Larson, 2009). Gupta et al. (2019) discussed that a lack of a precise project scope contributes to higher failure rates among projects in construction. In construction projects, the scope often lacked definition. The absence of definition was determined to be caused by a lack of a clear organization strategy for enhancing market advantages (Gamble et al., 2019).

The lack of stakeholder involvement in the planning phase of a construction project was a cause for failure (Nguyen et al., 2019). Also, over-involvement can lead to conflicting interests and project complexity (Nguyen et al., 2019). According to Aaltonen and Kujala (2016), balancing stakeholder interests in construction projects lead to enhanced quality, increased satisfaction, and the reduction of expensive and inadequate features. Therefore, stakeholder management was critical to ensure the project scope is defined per the constraints.

Complexity was a common influence driver that contributed to higher failure rates within construction projects (Abdullah et al., 2018). The complexity of construction projects has increased due to multi-stakeholder requirements (Gupta et al., 2019). Also, construction firms attempted to secure a significant market share while projects were diverse and unique in scope.
Inexperience increased uncertainty within the executing agent and project delivery team. As a result, construction team members were driven to avoid significant risk management decisions under the pressures of the timeline and budgetary impacts (Nguyen et al., 2019).

**Schedule delays.** A critical factor in schedule delays was the initial estimation of work activity durations. Project managers were overly optimistic about lead times, material deliveries, and availability of resources (Prater et al., 2017). Also, stakeholders influenced unrealistic schedule timelines for construction projects without understanding the overall complexity of the endeavor (Prater et al., 2017). Additionally, firms can develop unrealistic timelines to secure a construction project. Unrealistic timelines can affect the project initial baseline schedule. Prater et al. (2017) argued that a project manager must establish realistic baselines to manage expectations and finish projects on time.

According to the Project Management Institute (2017), establishing a project schedule involved determining human resources, equipment, and material availability. All work activities need a bottom-up approach to estimate durations accurately. Establishing a project schedule means the project manager must have an understanding of the macro-environment to anticipate activity durations accurately (Porter, 1989).

Senouci and Mubarak (2016) argued that weather is an external environmental condition of construction project schedules. Kerkhove and Vanhoucke (2017) supported this claim by stating that weather was unpredictable in the North African region. As a result, a negative risk was introduced to the project schedule. Weather events such as high winds, extreme temperatures, dust storms, and rain prevent contractors from performing work activities. Managing scheduling risks during certain times of the year prevented uncertainty from being
introduced to construction project schedules (Kerkhove & Vanhoucke, 2017; Senouci & Mubarak, 2016).

According to Ansah and Sorooshian (2018), coordinating the construction workforce was filled with finding and setting up equipment correctly. Famiyeh et al. (2017) claimed that schedule delays are caused by waiting for answers from project delivery team members, poorly budgeted activities, and material and equipment delivery delays. Zidane and Andersen (2018) added that project schedule development was a dynamic force that needed to be coordinated to ensure that contractors were not working in the same location at any given time. It can be inferred that managing negative risks through training contractors on equipment usage, answering and directing work, and ensuring workers are not assigned into a single location was essential to maintaining and controlling the project schedule.

Scope complexity caused schedule delays (Famiyeh et al., 2017). Famiyeh et al. (2017) postulated that complexity introduced negative risks into the project with scope changes, differing site conditions, and bureaucracy. Zidane and Andersen (2018) supported this claim by expressing that complexity led to scope changes and change orders. These negative risks led to additional time being added to the project schedule, which delayed the delivery date. Bakhshi et al. (2016) claimed that timely communication and experienced project managers were crucial to revealing and fixing potential risks associated with schedule delays.

**Budget overruns.** Budget overruns, also known as cost overruns, are referred to as an unexpected budget increase, cost increase, or cost growth (Plebankiewicz, 2018). According to Shehu et al. (2014), an excess of 50% of Malaysian construction projects were discovered to have cost overruns. Welde and Odeck (2017) postulated that costs for road construction projects were underestimated in 90% of projects, and actual costs were approximately 28% higher than
the initial estimates. Abdullah et al. (2018) researched oil refinery construction and determined that only 51.7% of project managers claimed that their projects were delivered within the estimated budget. Ahiaga-Dagbui and Smith (2014) reported that of 20 capital-intensive commercial projects, costs were estimated to be 114% more than the total initial budgeted baseline.

According to Abdullah et al. (2018), the primary negative risk for budgetary overrun was underfinancing. The allocation of inadequate funds to a construction project at the start led to failures (Zidane & Andersen, 2018). A study was conducted on project acquisition strategies and found that bidders tend to underestimate to enhance competitive offers that eventually led to project failure (Alaviour & Arditi, 2018). Liu et al. (2018) suggested that optimistic cost estimating hindered the project budget. Ansah and Sorooshian (2018) suggested that to avoid the negative risk of budget overruns, an experienced estimator would need to be familiar with the scope of work, region, and schedule of the construction project.

Scope creep was considered the unmanaged change to the construction project scope (Project Management Institute, 2017). According to Keng et al. (2018), scope creep occurred when the project deliverables were not well defined, or the management team attempted to gold plate the project. Gold plating was defined as the act of making unauthorized improvements to the project without the consent of the customer (Project Management Institute, 2017). Zidane and Andersen (2018) argued that mitigating the negative risks of scope creep and gold plating was vital to completing a successful construction project. Risk management in this scenario required change control methods to restore the balance among project constraints (Keng et al., 2018).
Qazi et al. (2016) suggest that the larger a construction project, the more negative risk potential for overrunning the budget increases. This was because of underestimating the complexity and the region of the project (Alavipour & Arditi, 2018; Qazi et al., 2016). The region of the construction project influenced the cost estimate, because of rapidly changing inflation/exchange rates, changes in equipment, and material costs. The result was a negative risk of cost overruns. Zidane and Andersen (2018) supported this conclusion by offering that complexity led to the tendency of omitting certain aspects of the cost estimate.

**Risk Management**

Managing risk on a project is vital to maintaining constraints and accomplishing the project. Risk management includes all the processes involved in identifying, regulating, and mitigating risk within a project (Allen, 2015). The objective is to enhance positive risk events while decreasing the likelihood of adverse risk events. An example of a positive risk event would be an opportunity to save time or costs. A negative risk event example would be a threat to time or costs. Allen et al. (2015) argued that thoroughly performing risk management processes minimized the potential for project cost overruns or schedule delays.

Jimoh et al. (2016) defined the term risk as unknown/known occurrences that had the potential to impact expectations during the construction project implementation. Cagliano et al. (2015) postulated that risk was the probability of uncertain, unpredictable, and even undesirable events that changed the prospects for project profitability. According to Cagliano et al. (2015), these risks/uncertainties were inherent to construction projects more than other industries; therefore, the need for enhanced risk management processes. Cagliano et al. (2015), suggested that risk was dynamic throughout the project lifecycle. Negative risk events jeopardize the realization of the project objectives and must be effectively managed.
Adafin et al. (2018) identified risk management as an essential tool to mitigate construction risks and to overcome potential issues of delays and overruns that led to project failure. The research described risk management as a management technique that attempted to identify potential sources of risks as well as uncertainty. Once identified, the impacts were determined, and appropriate mitigation tactics were implemented. This is consistent within the Project Management Body of Knowledge context, which provided a comprehensive and systematic way to identify, analyze, and respond to risks to achieve project objectives (Project Management Institute, 2017).

Improper risk management on construction projects negatively impacted productivity, performance, time, and cost (Hartono et al., 2019). Carvalho and Rabechini (2015) postulate that unmitigated risks are one of the key causes of project delays or failure. Hartono et al. (2019) demonstrated that there was a relationship between time delays, cost overruns, and failure to meet scope in construction projects, due to the absence of risk management techniques in project management processes.

The ability to assess risk and conduct good risk management determined the success or failure of construction projects (Adafin et al., 2018; Cagliano et al., 2015; Nguyen et al., 2019). Risk management within construction projects was recognized as a vital component of the project management processes to achieve defined objectives. Risk management helped the key project participants-client, contractor or developer, consultant, and supplier to meet their commitments and minimize negative impacts on construction project performance concerning cost, time and quality objectives (Adafin et al., 2018; Hartono et al., 2019).

**Risk identification.** Risk identification includes identifying potential risks clearly and determining which will impact the construction project. The extent of the impact encompasses...
documenting the characteristics and tracking these risks (Project Management Institute, 2017). According to Iqbal et al. (2015), construction was the aggregate of surrounding region, conditions, or influences. Turkyilmaz et al. (2019) described this environment as the external influences on the construction process. Therefore, the external environmental condition referred to all potential influencers outside the construction project. Xia et al. (2018) conducted a comprehensive review of project risk management theory and established that the environment does influence construction project constraints. This meant that less predictability within the environment produced a more significant potential of repercussions on the project constraints. The project delivery team must develop and establish risk management plans based on the construction project environment. The external environment conditions included regional politics, economics, sociocultural, technological capabilities, environmental, and legal environment in which the construction was being undertaken (Porter, 1989).

**Qualitative risk analysis.** According to the Project Management Institute (2017), qualitative risk analysis provided an initial understanding of the size and breadth of the potential risk impact. These potentials were arranged according to the degree of the impact on the construction project objectives. Fageha and Aibinu (2014) supported this claim by expressing that the qualitative assessment was essential to determine the importance of potential risks and understanding, which needed more focus than other lesser known risks. Once the qualitative risk analysis was accomplished, the quantitative risk analysis was performed on the potential risks with the most likely or most severe impact (Keshk et al., 2018).

**Quantitative risk analysis.** The quantitative risk analysis involves determining the numerical effects of identified risks on the construction project objectives (Project Management Institute, 2017). Quantitative risk analysis is used in evaluating the aggregate effects of the risks
that affect the project. According to Keshk et al. (2018), the benefit of quantitative risk analysis processes created information about the risks to support the decision-making of stakeholders, project managers, and project delivery teams. The process revealed and minimized the uncertainty of the construction project, which allowed the project delivery team to confront the risk.

**Plan risk responses.** Planning risk responses involves developing options and actions to reduce threats and to take advantage of opportunities to construction project objectives. According to Turkyilmaz et al. (2019), it was critical to reduce/minimize negative risk threats and take advantage of positive risk opportunities during construction project implementation. The existence of too many negative risks decreased the likelihood of successful construction project implementation. Taking advantage of positive risk opportunities assisted with delivering projects ahead of schedule, under budget, or maintain scope (Turkyilmaz et al., 2019). Each risk should have a corresponding discussion (Keshk et al., 2018). Keshk et al. (2018) suggested that resources and assets could be better allocated to the schedule, budget, and project management plan. The benefit offered by planning risk responses was that it addressed each potential according to priority. Negative and positive risk responses were developed and organized into categories. Negative risk response categories included avoidance, transference, mitigation, or acceptance of each potential risk (Project Management Institute, 2017). Positive risk response categories included exploitation, sharing, enhancement, or acceptance of each potential risk (Project Management Institute, 2017).

A risk avoidance response was based on changing the project plan to eliminate the potential (Project Management Institute, 2017). Risk avoidance included eliminating unwanted consequences or protecting the construction project objectives from the risk effects. According to
Vahlne et al. (2017), avoidance or removal of all risks was not feasible. In these scenarios, the risks should be confronted and managed as early as possible.

Transferring risk means consequences of risk were placed upon a third party (Project Management Institute, 2017). Transferring risk places responsibility of the potential onto another party without avoidance, mitigation, or acceptance. According to Lam and Siwingwa (2017), a common practice was to financially obligate insurance or bonding agencies that represented the construction contractor. Insurance or bonding was considered an effective approach in markets where price volatility impacted future costs.

The goal of a mitigation response was to reduce the potential occurrence or consequences of an identified risk (Project Management Institute, 2017). Risk mitigation involved reducing the negative potential impacts to an acceptable level. According to Bao et al. (2019), on construction projects, risk mitigation involved the project delivery team conducting geotechnical investigations to ensure the foundation was designed for a practical region/topography. In this case, the appropriate mitigation response included changing the design to minimize the potential negative impacts of the risk (Tanner et al., 2018).

Risk acceptance involved accepting the consequences of the occurrence (Project Management Institute, 2017). Tanner et al. (2018) suggested that the project management team may be unable to diagnose or adopt an effective response. Acceptance as a response to risk included developing contingency or fallback plans. The contingency plan led to diagnosing the risk, which assisted with reducing the cost of the response. The fallback plan confronted the risk after it occurred. Risk acceptance involved allocating additional human/financial resources or changing the scope/schedule of the construction project (Niekerk & Bekker, 2014).
Exploiting positive risks were the actions taken to ensure the opportunity was realized (Project Management Institute, 2017). Exploiting positive risk was the counterpart to avoiding a negative risk. Senesi et al. (2015) explained that exploiting project opportunities were not as common. Construction project managers were risk-adverse. By taking the initiative and exploiting opportunities, the project manager developed plans that ensured the benefits of the opportunity were achievable.

Sharing positive risks was the act of disseminating information toward similar construction projects (Project Management Institute, 2017). Disseminating information of an opportunity allowed other project managers on other construction projects to reap the rewards of new-found knowledge. Sharing positive risks was the counterpart of transferring risks. Shi et al. (2019) suggested that distributing information about positive risks provided construction teams with incentives to improve project efficiencies. Improving construction project efficiencies created opportunities for firms interested in increasing profit margins, institutional knowledge, and customer satisfaction.

Enhancing positive risks was the act of increasing the probability that an opportunity would occur (Project Management Institute, 2017). Odediran and Windapo (2017) posited that enhancing positive risks provided opportunities to increase the beneficial impact on construction projects. Enhancing positive risks was similar to the mitigation of risk. Proactive approaches improved probabilities but did not guarantee positive outcomes during project implementation (Odediran & Windapo, 2017).

Accepting positive risks was similar to accepting negative risks. Accepting a positive risk involved planning to take advantage of the opportunity (Project Management Institute, 2017). When a positive risk event occurred, the project manager or project delivery team acted to take
advantage of the opportunity with a developed plan. Odediran and Windapo (2017) suggested that accepting positive risks involved proactive approaches to pursue favorable opportunities.

**DeLone and McLean**

The DeLone and McLean (2003) identified factors for project success other than the Traditional Project Triangle which focused on maintaining the scope, schedule, and cost constraints (Project Management Institute, 2017). The DeLone and McLean model focused on universal success measures that applied to all projects. These universal success measures included project quality, functionality, and user satisfaction. The universal success measures established by the DeLone and McLean model suggested that the better the match between quality and functionality produced a more likely positive impact on user satisfaction on construction projects. Fageha and Aibinu (2016), suggested that meeting quality, functionality, and user satisfaction started with defining the project requirements and was vital to implementing a successful project.

**Defining project requirements.** DeLone and McLean (2003) and Project Management Institute (2017) suggested that functionality and quality were a measure of how well the project scope fit the customer/stakeholder needs. Activities to develop a project scope started before the initiation phase with the business need (Project Management Institute, 2017). According to Zwikael et al. (2019), the collecting project requirements process began with a business need assessment. The business need assessment evolved through feasibility studies to validate the project business case. The purpose of a project business case was to justify how a project fulfilled the organizational need (Project Management Institute, 2017).

Collecting project requirements involved the process of determining, documenting, and managing stakeholder needs to achieve project objectives (Project Management Institute, 2017).
Requirements have always been a concern in project management and continue to gain more attention in the profession (Hussain et al., 2016). Clients started to recognize how to use business analysis to their competitive advantage by defining, managing, and controlling project requirement activities in a complex global environment (Porter, 1989).

Fageha and Aibinu (2016) posited that project requirements start with a high-level scope statement and become progressively more detailed. As information was developed and refined, the project requirements became better defined. Mabelo and Sunjka (2017) supported this by suggesting that before project constraints were developed, the project requirements need to be unambiguous. Unambiguous project requirements meant that the project scope needed to be measurable, traceable, complete, consistent, and accepted to the key stakeholders (Mabelo & Sunjka, 2017).

Serrador and Pinto (2015) claimed that in iterative lifecycle projects, a high-level vision was developed for the overall project. The detailed scope was determined one iteration at a time. Detailed planning for the next scope iteration was accomplished as the project progressed. Wagner et al. (2016) described an iterative project as a construction project that encompasses a project delivery team composed of several designers who exchanged information. The project delivery team information was exchanged in a formal manner, such as periodic meetings, and was considered a design iteration.

Validating requirements. Validating the project scope was the process of formally inspecting the completed deliverables for acceptance (Project Management Institute, 2017). Scope validation was a component of the project management practice (DeLone and McLean, 2003; Project Management Institute, 2017). According to Blomquist et al. (2016), the validation process offered an objective approach to the project deliverable acceptance. The validation
process increased the probability of final acceptance by ensuring each deliverable met the end-user requirements. When the process was performed periodically throughout the project, there was a higher likelihood that the final deliverable fit the intended purpose (Hassan et al., 2018). DeLone and McLean (2003) supported this conclusion by suggesting that the verified deliverables obtained from the quality control processes were reviewed with the customer or sponsor to determine the deliverables matched the scope. Validation processes included activities such as visual verification, measurements, and evaluations to determine whether the deliverables meet the requirements of the project acceptance criteria (Blomquist et al., 2016). The stakeholder inspections and investigations were considered walkthroughs, product reviews, and product analysis (Project Management Institute, 2017).

Deliverables that fit the intended purpose of the project were formally signed off and approved by the customer or sponsor (Hassan et al., 2018). Formal documentation was presented by the project manager to the customer or sponsor that acknowledged the formal stakeholder acceptance of the project deliverables. DeLone and McLean (2003) suggested that there was a correlation between project scope and the intended purpose of the project. The measure of these two points in the project was considered the level of quality (Martens & Vanhoucke, 2018). Project deliverables that did not fit were rejected or changed as needed which required a project change process (Iyer & Banerjee, 2016). When this occurred, the project could experience changes in the constraints such as cost, time, and scope baselines. The change process was repeated until the final project deliverable was accepted by the stakeholders (Iyer & Banerjee, 2016).

Measuring customer satisfaction. According to Kärnä and Junnonen (2017), in a construction project, stakeholder satisfaction was a critical component used to measure the
success of the project. Windapo and Qamata (2015) supported the DeLone and McLean model (2003) by postulating that the view of project success was determined in areas such as deliverable quality and client satisfaction measures. This measure was a success criterion that highlighted the importance of communications and collaboration with stakeholders and the project delivery team (Heravi et al., 2015). Oppong et al. (2017) posited that stakeholder satisfaction measuring approach also took into account aspects of project complexity. It was stated that traditional triple constraint success measures were criticized for simplifying the dynamic project environment (Oppong et al., 2017).

Kärnä and Junnonen (2017) suggested that stakeholder satisfaction was a vital indicator for a successful project as well as traditional hard success measures such as the triple constraints. The importance of stakeholder satisfaction was emphasized in the literature as a measure of project success (Fageha & Aibu, 2016; Heravi et al., 2015). Kärnä and Junnonen (2017) studied stakeholder dissatisfaction factors. The research discovered that contractors and project managers should be detail-oriented to solve day-to-day issues on site. Being detail-oriented to solve day-to-day issues on site ensured the project scope did not creep from the original requirements. Herremans et al. (2016) supported this conclusion by expressing that a surprised stakeholder was a dissatisfied stakeholder.

Davis (2017) research concluded that stakeholder perception was key to a successful project. It was discovered that there were three interdependent success factors associated with customer satisfaction. These interdependent success factors included effective management, design team communication, and project enabler actions (Davis, 2017). The findings suggested that project participants among stakeholders led to a more successful project. The common denominator within these characteristics was the level of communication, such as developing a
collaborative project goal, establishing roles and responsibilities, and reporting project performance throughout the project entire lifecycle (Davis, 2017).

Zuo et al. (2018) noted that project stakeholder satisfaction could be determined by the implemented soft skills. The research conclusions suggested that the project manager’s ability to communicate and cooperate with stakeholders during the project was vital. Thompson (2019) postulated that communicating led to higher levels of perceived project quality. Project quality referred to how well the project was organized and managed from a qualitative perspective of the stakeholder. It was concluded that quality in the planning phase was based on the following factors: cooperation with stakeholders, project requirements, and communications with the project owner, overall project management leadership, and level of teamwork. These factors were supported by Zuo et al. (2018), which emphasized the relevance of soft skills such as rich communication. It was concluded that the level of communication was related to perceptions of stakeholder satisfaction. In terms of stakeholder satisfaction, how well project performance was communicated led to higher perceptions of quality.

Time-dependent

Shenhar et al. (2002) argued that determining success based on the schedule, budget, and scope were misleading indicators. It was indicated that the project meaning of success criteria should evolve from the simplistic triple constraint into something that encompasses additional success criteria. The Project Management Institute (2017) supported this by suggesting that the concept of project success was customer dependent. This suggested that the customer defines whether a project was successful versus the ability to maintain project constraints. Shenhar et al. (2002) proposed a concept that measured project success based on four levels. These levels of
project success include: 1) project efficacy, 2) customer impact, 3) business success, and 4) preparation for the future.

You et al. (2018) studied uncertainty as it affects a project. It was suggested that environmental condition uncertainty was defined as sources of risks outside the scope of the project. Zidane and Andersen (2018) provided a list of potential issues that affect Time-dependent projects. The list of potential issues that affect Time-dependent projects were considered to be design changes, delayed contractor payment, poor planning and scheduling, inadequate site management and supervision, incomplete design, inexperienced contractors, financial difficulties, sponsor/customer financial difficulties, shortage of resources/material (human resources, machinery, equipment), and lack of skilled labor (Zidane & Andersen, 2018). You et al. (2018) supported this claim by suggesting financial issues, shortage of resources/material, and lack of skilled labor were external environmental conditions that attributed to project failure.

**Project efficacy.** Shenhar et al. (2002) defined project efficacy as meeting the operational performance requirements, meeting the technical performance, and achieving the deliverables on schedule and budget. Zidane and Olsson (2017) offered a definition that supports the description of project efficacy by explaining it as an end product that possessed a quality that could potentially lead to an effective outcome. This meant that project efficacy answered the will it still work question. Bai and Du (2018) suggested that project efficacy was vital when other interdependent projects were being executed at the same time to achieve an organizational strategy. The emphasis was less critical on maintaining the triple constraints in these scenarios, while the intended purpose was more critical of the interconnected construction projects. This leads to project efficacy being the first measure of success.
Chin and Hamid (2015) posited that the project schedule was critical to meeting stakeholder needs. The project manager has the onus of delivering project outputs on time, within the budget, and according to scope (Sanchez et al., 2017). The management of time means coordinating work effectively to progress the project forward (Iyer & Banerjee, 2016). These studies suggested that project efficacy was closely linked to the Traditional Project Triangle. In contrast, the Traditional Project Triangle places equal emphasis on scope, budget, and time. In the Time-dependent concept, there was more emphasis placed on meeting the project schedule. Hanak and Korytarova (2018) supported this by claiming that the project manager’s ability to manage the schedule assisted in controlling costs. Zheng et al. (2019) also supported this research by suggesting that the most common influencer of poor project performance was time management.

**Customer impact.** Shenhar et al. (2002) suggested that customer impact included addressing a recognized need, solving a problem for the customer, the customer uses the product, and the customer is satisfied with the deliverables. Williams et al. (2015) suggested that customer impact and other client relationship attitudes have emerged as a criterion for determining project success. From the customer perspective, this answers the question of what value can be gained from this project. Kuwaiti et al. (2018) claimed that customers can have varying degrees of success criteria. This suggests the customer impact is individualistic based on perception. Measuring these impacts were derived from customer encounters and interactions when engaging with the project deliverables (Shamim et al., 2017). A positive engagement allowed customers to perceive value and resulted in project success. The project loses value and fails if customers have a negative engagement.
Haverila and Fehr (2016) researched the relationship between project deliverables and customer satisfaction. The results demonstrated that a project that delivered superior performance has a direct impact on perceived customer satisfaction. Williams et al. (2015) suggested that the level of customer satisfaction concerning quality changed significantly depending on whether that project was delivered on-time or late. Kärnä and Junnonen (2017) suggested that customer satisfaction in construction projects was a primary measure of a successful project. The research was consistent with DeLone and McLean model and suggested that customer satisfaction was linked to project success.

**Business success.** Shenhar et al. (2002) explained that business success included several sub-factors. The sub-factors included an increase in market share, creation of a new market, creation of a new product-line/operational processes, or development of new technologies. Serra and Kunc (2015) suggested that businesses needed to ensure that construction project success was linked to the firm’s strategy. This required a clear definition of how to evaluate whether each project is successful. This established a benefits realization management measure that determined the value and strategic relevance of each project. Iverson (2018) supported this by opining that when evaluating business success, financial statements, analysis, and metrics were tools to measure these common goals. Iverson (2018) also suggested that every industry defined success in various ways; most would agree that increased capacity for new growth or profits was a common denominator.

Haffer and Haffer (2015) provided evidence that project performance was related to satisfaction levels. It was determined that this was a critical driver for business excellence improvement. The results of the research suggested that successful realization of projects significantly influenced employee satisfaction and increased output. Anantatmula and Rad
(2018) reported that when the organizational project satisfies customers, that firm was likely to succeed. The research suggested that when projects were delivered on time, customers were satisfied, and the firm succeeds. When a project fails to be delivered on time, customers were dissatisfied, and the business weakens or loses its market share. Musawir et al. (2017) supported this conclusion by suggesting that project selection and governance was vital to achieving success.

**Future preparedness.** Preparing a firm for the future was a component of the Time-dependent model (Shenhar, 2002). Musawir et al. (2017) claimed that strategic alignment enhances the firm’s ability for sustained growth, effectiveness, and efficiency. Kaiser et al. (2015) suggested that project selection must align with organizational strategy to achieve the most significant potential benefit from the completed project. Project Management Institute (2017) explained that the processes that guided project management activities created a unique product, service, or results that prepared a firm for future strategic and operational goals. Shenhar et al. (2002) supported these definitions of future preparedness in determining project success as the effectiveness of meeting long-term impacts and interests.

Haverila and Fehr (2016) and Musawir et al. (2017) provided that when projects were delivered on time and met customer expectations, the business was better equipped to meet future needs. Rank et al. (2015) offered that organizations prepared for the future by selecting projects that advance the firm’s strategy. A clear business strategy was required to accomplish good selection criteria and project portfolio management. When organizations lacked a clear strategy, the business failed to prepare for the future (Gamble et al., 2019). Bai and Du (2018) supported this claim by suggesting that interdependent projects need to be executed on time to achieve an organizational strategy.
Discussion

The literature review expanded on several topics related to the proposed research. The region of North Africa was identified and expanded. The North Africa region is comprised of five countries (Algeria, Egypt, Libya, Morocco, and Tunisia). The total landmass is estimated at 5,072,171 km² (3,151,700 mi²). The estimated population of the region is 185.4 million. This is half the landmass of the United States, with half the population respectfully. Total capital investment with a focus on construction projects in the region is expected to be $30 billion in the next four years.

A construction project was defined as a temporary endeavor that consisted of a defined schedule, scope, and resources to create a unique product, service, or process. The five lifecycle phases of a typical project were defined as initiation, planning, execution, monitoring/controlling, and close-out. Project management was defined as the application of knowledge, skills, tools, and techniques to achieve a project objective or goal. The definition of a project manager differs from functional and operational management. Functional managers focus on providing oversight of functional or business units. Operational managers were determined to be responsible for ensuring that business processes are operating efficiently.

The traditional definition of project failure was expanded. The traditional meaning suggests that failure is defined by a construction project, not achieving one of three constraints. These constraints are construction project schedule, cost/budget, or scope. Risk management tools and techniques are incorporated into the construction project to develop positive impacts and decrease potential negative impacts from risk. Negative and positive risk responses can be developed and organized into four categories. These negative risk response categories are to avoid, transfer, mitigate, or accept each potential risk (Project Management Institute, 2017).
Positive risk response categories are to exploit, share, enhance, and accept (Project Management Institute, 2017).

The three concepts from the conceptual framework were utilized to compare and contrast construction project success factors. The project success factors were explored exhaustively throughout the literature review. These three concepts of construction project success factors included the Traditional Project Triangle, DeLone and McLean, and Time-dependent. The Traditional Project Triangle concept was defined as an undertaking and completing a project within scope, schedule, and cost. The DeLone and McLean concept focused on quality, functionality, and user satisfaction. In this concept, quality is considered a measure of the fit between project scope and the intended purpose. This suggests that a better match between quality and functionality produces a more likely positive impact on user satisfaction. The Time-dependent concept suggests that the customer/stakeholder defines whether a construction project is successful versus the ability to maintaining project constraints. The concept focused on four measures that included project efficacy, customer impact, business success, and preparation for the future.

Finally, items that were potentially missed in this literature review could include alternate concepts of construction project success. The focus was on the Traditional Project Triangle, DeLone and McLean, and Time-dependent in this literature review. For instance, an alternative could include the expanded version of the Traditional Project Triangle that includes cost, scope, schedule, quality, resources, and risk as determining factors of construction project success. Additionally, an alternate project management guide could be considered Prince2. This methodology offers seven stages of a project similar to the project lifecycle, such as the startup of a project, initiation of a project, directing a project, managing stage boundaries, controlling
stages, managing product delivery, and closing a project. The Prince2 project management methodology is utilized in the United Kingdom, Western Europe, and Australia. However, the Project Management Institute is the most commonly recognized and accepted internationally.

**Transition and Summary of Section 1**

The foundation of the research was established in section one. Section one included ten building blocks: 1) background of the problem, 2) problem statement, 3) purpose statement, 4) nature of the study, 5) research questions, 6) conceptual framework, 7) definition of terms, 8) assumptions, limitations, and delimitations, 9) significance of the study, and 10) literature review. Providing this information in this format allows the reader to draw a direct link to the foundational elements of the research project. The background of the problem suggested that construction project success was individualistic because all projects were unique with varying requirements (Project Management Institute, 2017). The general problem to be addressed is the high failure rates within construction projects. The specific problem to be addressed is the failure rates within construction projects located in Northern Africa when compared to other regions. The purpose of this qualitative case study is to explore the relationship between external environmental conditions and construction project failures in countries of Northern Africa. The nature of the study is a qualitative method with a bound and collective case study design. The research questions attempt to determine the external environmental condition and influence drivers that negatively impact construction projects in Northern Africa. The three concepts selected for this research are employed in developing an understanding of construction project success. The concepts, when used together, can triangulate collected data to identify external environmental conditions and influence drivers that negatively impact construction projects. This leads to improved decision-making abilities and a higher probability of successful construction
project completion. The definition of common terms portion of this document offers the readers a basic knowledge of common terminology within the field of study. The assumptions, limitations, and delimitations provide a level of transparency to the research that reveals elements that could have influenced the researcher. The significance of the study introduces the reader to the importance of the topic being studied. Finally, the literature review provides a method to explore the existing research and discusses the area of study.

**Section 2: The Project**

Section two provides the reader with an overview of the project elements of the research presented. There are eight subsections to this portion of the research. These include the following: 1) purpose statement, 2) the role of the researcher, 3) description of participants, 4) research method and design, 5) population and sampling, 6) data collection, 7) data analysis, and 8) reliability and validity. Providing this information in this systematic format allows the reader to draw a direct link from the foundation of the research to the data collection and data analysis processes.

**Purpose Statement**

The purpose of this qualitative case study was to explore and describe the impacts between external environmental conditions and construction project failures in countries of Northern Africa. The specific problem was explored through an in-depth study of external environmental conditions. The effects on construction projects from these external environmental conditions establish contextual descriptions. These contextual descriptions reveal the external environmental conditions that influence construction project outcomes in Northern Africa. The information gleaned from this study enhances the understanding of the negative risks
in Northern Africa and construction projects, which expands on the body of knowledge of project management.

Studies implied that construction projects in Northern Africa have dynamic situational occurrences in which potential negative risks materialize anytime during the project lifecycle (Damkjaer & Taylor, 2017; Moawad et al., 2016). According to Vereen et al. (2016), risk management on typical construction projects involved processes that identify, evaluate, and manage potential influencers that impact cost, schedule, and scope. Previous research conducted by Qazi et al. (2016), suggested that excluding any risk can lead to adverse project outcomes that affect the project constraints. In that study, consideration of external market conditions and country related complexities related to the environment were not determined to be relevant. Risk identification, evaluation, and management processes must not be limited to a single phase. An iterative process should be implemented and exercised throughout the construction project lifecycle to identify and manage negative risk influencers effectively.

**Role of the Researcher**

The role of the researcher in this qualitative study was to serve as the principal researcher. The principal researcher was responsible for participant selection, data collection, data analysis, and setting forth the research conclusions. The researcher established and maintained ethical processes while developing the research (Hoonaar and Hoonaar, 2016). The research included surveys and interviews with individual participants, which required an evaluation of three germane ethical principles. These ethical principles included 1) respect for the individual’s dignity, 2) welfare, and 3) justice (Hoonaar and Hoonaar, 2016).

According to Creswell and Poth (2018), respecting the autonomy of the individual was a critical consideration to qualitative research. Next, the researcher was responsible for ensuring
that the welfare of the individual was not harmed or placed at risk during the research processes. Lastly, the researcher was tasked with the duty to uphold the principle of justice and to ensure individual participants were treated equally. The responsibilities of respecting the individual participants, welfare, and justice were accomplished by using the following strategies: 1) disclosing the researcher’s employment history, 2) disclosing the researcher’s philosophical worldview, 3) providing participants with equal treatment, 4) obtaining participant consent, and 5) developing a protocol for surveys and interviews.

The researcher was the primary data collector (Flick, 2018). The researcher disclosed potential biases to ensure the validity of the study. Biases or perceived biases can impact the understanding of data collection and data analysis. The researcher mitigated these biases by disclosing employment history and philosophical worldview. An understanding of the researcher’s employment history and worldview assisted with minimizing potential impacts within the research.

The disclosure of the relevant employment history of the researcher was the first strategic component that was important to upholding the respect, welfare, and justice of the participants in this research. The researcher is currently a chief program manager for the US Army Corp of Engineers (USACE) that manages a portfolio of related construction projects. The researcher has spent several years working a myriad of construction projects. As an individual with prior project management experience in the construction field, there was a potential bias related to the outcomes of this research. Construction project managers were surveyed and interviewed for a sample of this qualitative study. Thus, the primary researcher was obligated to set aside any personal views of the project outcomes to ensure data collection and analysis was objectively presented.
The researcher’s philosophical worldview was the second strategic component that was important to upholding the respect, welfare, and justice of the participants in this research. The postpositivism worldview most closely aligns with the primary researcher’s philosophical worldview. Postpositivism is a philosophical theory that states that there is a single reality beyond ourselves (Creswell and Poth, 2018). A scientific research approach can lead to an objective understanding of this reality. Post-positivists often conduct additional research that could change the outcomes of previous research (Creswell and Poth, 2018). For instance, collected data in the present time and careful analysis of that data could lead to a new and logical conclusion. It is understood that data related to a particular subject may not be available. Therefore, in five, ten, or twenty years, an outcome could change due to the additional data that is available for collection. Philosophical perspectives were not the focus of this research. A logical and disciplined approach was essential to the primary researcher in order to develop an objective outcome for the research.

Equal treatment of participants was a third strategic component that was critical for maintaining respect, welfare, and justice for the individuals involved in this research. Frey (2018) identified three populations as potential at-risk participants in research. These populations included individuals with certain medical conditions, prisoners, and children. The participants selected for this research were not within the identified at-risk category populations (Frey, 2018). This research dealt with project outcomes in construction markets and project managers. Therefore, the participant selection criterion depended on the type of construction, the region, and the role of the project manager. The selection criterion was applied equally to all participants.
Obtaining participant consent was the fourth strategic component that was essential to upholding the respect, welfare, and justice of the participants in this research. According to Health and Human Services (2018), all researchers should obtain participant consent. Participant consent for this research provided the individual with the purpose, risk, and benefit regarding the research. Consent ensured that the researcher provided all individuals with a sufficient period to consider all options, answer inquiries presented, ensure all information is understood, and gain voluntary participation agreements. Finally, obtaining consent provided participants with the probable outcome from the research and allowed participants to withdraw from the data collection at any time. These actions provided autonomy to each of the participants.

Using survey and interview protocols was the fifth strategic component that was essential in upholding the respect, welfare, and justice for the participants in this research. Using survey and interview protocols standardized the format of data collection (Castillo-Montoya, 2016). Following through with survey and interview protocol elicited a rich and detailed qualitative data for understanding participant experiences. This was accomplished by developing systematic approaches with little variation (Castillo-Montoya, 2016). This formatted approach reduced the possibility of researcher bias being introduced through leading questions.

Tactfully implementing surveys and interviews is the fifth strategic component that was essential in upholding respect, welfare, and justice for the participants in this research. According to Yin (2014), qualitative questions should be open-ended. Utilizing this approach, participants tended to provide an in-depth and real-world context response to survey and interview questions.

**Participants**

Access to those involved in construction projects was accomplished by contacting major firms operating in the region and requesting permission. Initially, participants were contacted via
email. The email communication outlined the objective of the research. Periodic contact with participants was conducted throughout the data collection processes to ensure a full understanding of all questions. For this research, there was a possibility of 147 potential participants, 32 firms in Morocco, 29 firms in Algeria, 35 firms in Tunisia, 19 firms in Libya, and 32 firms in Egypt.

The names of respondents were not collected in the data set to protect the anonymity of participants. Participants were coded according to the country. The development of a code key was kept separate in a password protected file only accessible to the researcher. The risk to participants was perceived to be minimal in this research. Diligence was maintained to safeguard participant information.

**Research Method and Design**

This study used a qualitative case study design. Case study research is suitable to explore and describe a particular incident or a series of incidences (Creswell & Poth, 2018). Creswell and Poth (2018) describe three types of case study research. The different types of case study research are distinguished by intent and identified as instrumental, intrinsic, and collective. Instrumental case study research focuses on singular incident or puzzlement and then selects one bounded case to explore this incident or puzzlement. Collective case study research focuses on singular incident or puzzlement and then selects multiple cases to explore this incident or puzzlement (Creswell & Poth, 2018). An intrinsic case study explores an incident of an unusual or unique situation.

Case studies are bound by specific timelines, activities, or processes from one or more participants. The researcher then develops an investigative analysis of the incident. A case study design was appropriate for this research because the researcher used multiple cases to explore
and describe the incidences of failed construction projects in the region of Northern Africa. According to Stake (2010), a case study researcher gathers data by interviewing, surveying, or collecting artifacts. For this research, surveys and interviews with open-ended questions were utilized to collect data.

Case study research was the appropriate method for this investigation because it provided a valid and reliable means for the collection of data and offering conclusions of this research. Case study research was also an appropriate method for this investigation because the common causes of construction project failure in Northern Africa were gathered using open-ended survey and interview questions. Collecting external environmental conditions and exploring the contextual descriptions of the influence drivers on construction project failures was the purpose of this selected qualitative research. Providing participants the ability to reveal the common causes of construction project failure through open-ended survey and interview questions was appropriate for exploring the topic.

**Population and Sampling**

The purpose of this study was to explore and describe the external environmental conditions and influence drivers within construction project failures in Northern Africa. The outcome of this research goal was to assist construction firms in becoming more successful in project implementation. This section describes the research population and the sampling methods utilized.

The population for this study was identified as construction project managers employed by construction firms operating in Northern Africa. These construction project managers were chosen due to the geographic access to these firms in Northern Africa. The population also offered an opportunity to gain a significant sample size. The primary researcher had easy access
to this population via electronic communication. Access to the population allowed for significant
data collection to fulfill the intended purpose of this research. The sample drawn from the
selected population was based on quota sampling via electronic communication.

Quota sampling is appropriate when choosing participants based on the availability over
convenience sampling (Vogt et al., 2017). Quota sampling ensured that participants from each
potential category were surveyed and interviewed. The potential sampling categories were
participants from each country in Northern Africa. Using this sampling method was proper for
this research because the primary researcher is in Okinawa, Japan. This study will survey and
interview participants to gather the required data. The participants will be asked to provide
detailed information based on a series of questions about construction projects on which the
project manager had direct knowledge to answer all questions.

Data saturation was a consideration as well as quota sampling. In qualitative research, the
lack of data saturation levels could negatively affect the quality of the research (Fusch & Ness,
2015). Data saturation was defined as the quality and quantity of information gathered. Data
saturation is achieved once no additional information or themes are recorded during data
collection (Guest et al., 2006). For this study, the researcher contacted a total of 147 possible
participants, which were construction firms that operate in Northern Africa. The number of
participants were updated once contact was accomplished.

**Data Collection**

Good data collection practices are vital to the development of quality research (Moser &
Korstjens, 2018). Data collection in this study was conducted through a qualitative research
design. As a result, the collection of data involved qualitative elements (Creswell & Poth, 2018).
For this study, open-ended survey and interview questions were used to collect data. The data collection approach is explained in the subsequent paragraphs.

Todorović et al. (2015) explain that there are numerous measures used in project management that can be used to determine current progress and overall project success or failure. For this research, conducting surveys and interviews using open-ended questions was the best method of collecting data. Open-ended surveys and interviews allowed for the expansion of information collected. The principal researcher developed open-ended questions to survey and interview participants to enhance the subject of the study. Survey and interview questions are available in the research Appendix A. Additional qualitative data collection methods are detailed in the subsequent paragraphs.

Permission to conduct surveys and interviews were from participants with the appropriate authority and who had prior knowledge of the construction project outcome. Once permission was granted, participants were contacted via e-mail with a description of the research and provided a survey. Raw data generated through surveys included the role of the project manager and why the project failed.

According to Moser and Korstjens (2018), qualitative research can be unstructured and flexible. Introducing structure during the data collection process assisted with developing a consistent level of quality. The structure also ensured that all participants were treated fairly and equally through the extent of the research. The survey and interview process contained the following procedures: 1) obtain permission from the appropriate authority, 2) obtain participant consent, 3) provide surveys via e-mail, 4) collect and record survey and interview responses, and 5) transcribe surveys and interviews as needed for coding purposes. For a construction firm to qualify for data collection, it must have had an active construction project in the region in the last
five years. Upon completion of the data collection procedure, only information about project failures were compiled.

The research included open-ended survey and interview questions to develop the common causes of construction project failures in the region of North Africa. Survey questions consisted of the following: Why did the construction project fail to be delivered on schedule? Why was the construction project not completed within budget? Why did the construction project fail to meet the functionality of the requirements? Why was the customer not satisfied with the final deliverable? Why did the construction project fail to achieve the organizational strategy? What was the overall value of the project?

Answers to these open-ended survey and interview questions were recorded, transcribed, and coded for emergent themes. The follow-up interview questions consisted of the following: How were the negative risks the external environmental condition described in the previous survey managed? Would you like to provide additional information on the survey questions pertaining to external environmental conditions? The survey and interview questions expanded on the negative risk influencers that contributed to the high rate of construction project failures in Northern Africa. The survey and interview answers developed a contextual description that represent the first research question of this research. Research sub-question one (SQ1) asks, *How do external environmental risks negatively impact construction projects in Northern Africa?* Research sub-question two (SQ2) asks, *How do project managers manage negative external environmental risks in the North African region?* Data for these sub-questions were collected through questions provided to the participant to determine if any external environmental conditions negatively impacted the construction project and how did the project manager respond.
Data Organization

The qualitative approach of this research required data collection through open-ended survey and interview questions. Information was then coded and organized to develop organized emergent themes. Coding the surveys and interviews assisted the researcher to organize information and develop emergent themes associated with the research. All qualitative data was protected using a password-protected computer as well as a password-protected Microsoft Excel file.

Data Analysis

For this research, completed surveys and interviews were separated into two clusters, successful construction projects, and failed construction projects. Then, surveys and interviews were codified with themes derived from the data collection procedures. Data was represented in a contextual description with a detailed explanation of the surveys and interviews combined.

Qualitative data analysis addresses collecting the common causes of construction project failure in the region of Northern Africa and what role the project manager played. The primary component of data analysis was to develop the common external environmental influences that cause construction projects to fail. For this research, construction projects from this region failed when any one of the following conditions were encountered: 1) the project was not delivered on schedule, 2) the project was not delivered within budget, or 3) the project did not meet the functional requirements (Bronte-Stewart, 2015).

The project manager of the construction project was a vital component of this research. For the purposes of this research, a certified project manager was defined as a Project Management Professional (PMP) that was certified through the Project Management Institute (PMI). The PMP is acknowledged as a valuable project management certification (Bredillet,
An individual that was PMP certified has obtained the knowledge and skills required to successfully achieve a qualifying threshold through an examination process. The individual also has completed 35 classroom hours of formal project management course work and has 4,500 hours with a bachelor’s degree or 7,500 hours with a degree of project management experience (Project Management Institute, 2017). A non-certified individual works as a project manager, was not PMP certified, and functioned with the same roles and responsibilities of a construction project manager. A non-project manager was an individual that does not work in the construction project management capacity. The following paragraphs describe this process in more detail.

The data collected via surveys and interviews were analyzed using the following process: 1) information will be codified, 2) themes will be developed, and 3) what role did the project manager play. Data collected from surveys and interviews were codified. Coding was the process of organizing the collected data by common themes and then developing a system that represents the overall meaning (Rossman & Rallis, 2012). The data from the open-ended questions was segmented into sentences and categories. Categories were characterized using the participant’s respective terminology. Once each category was developed, descriptive themes were developed. Themes developed were the significant findings from the open-ended survey and interview questions. From these emergent themes, the influence drivers that cause construction project failure were revealed.

Reliability and Validity

This section expands on the validity and reliability of the study. Validity and reliability were essential components that reflect the value of the outcomes within the study (Korstjens & Moser, 2018). Laumann (2020) posited that research must be both valid and reliable. When this
was achieved, the outcomes of the study have increased value. The validity and reliability of this qualitative study is discussed in the following paragraphs.

In qualitative research, the researcher established validity and reliability by developing credibility, transferability, and dependability. Research credibility is the equivalent of inner validity and focuses on the aspect of truth value. Credibility is the measure of researcher confidence in the information that was presented by the outcomes (Korstjens & Moser, 2018). Transferability is the equivalent of outer validity and focuses on the extent to which research outcomes can be transferred to situations or research meeting similar criteria (Korstjens & Moser, 2018). Dependability is the equivalent to reliability and focuses on how stable the collected data is over time and across varying conditions (Korstjens & Moser, 2018).

There are implements that the researcher can utilize to enhance credibility, transferability, and dependability. First, the researcher can use triangulation to examine multiple sources of data to confirm or answer the research questions to ensure exactitude (Cresswell & Poth, 2018). Second, the researcher can implement disconfirmation, which discloses the exceptions to established themes within the study (Cresswell & Poth, 2018). Third, the researcher can implement reflexivity to compare recently collected data versus historical collected data (Cresswell & Poth, 2018). Finally, the researcher can attempt to accomplish a degree of data saturation. Data saturation is accomplished when sufficient amounts of data is collected to replicate the study, when the ability to obtain new data is reached, or when further coding is no longer possible (Fusch & Ness, 2015).

Triangulation was utilized in this study to establish credibility, transferability, and dependability for RQ1. RQ1 asks, *What are the external environmental conditions that negatively impact construction projects in Northern Africa?* The researcher collected data from
multiple sources that had direct knowledge of construction projects undertaken in the Northern African region. According to Fusch et al. (2017), collecting data from multiple sources resulted in research triangulation. Data triangulation and data saturation are interconnected (Weller, 2018). Good data triangulation ensured that data saturation was achieved.

Data saturation was also utilized in this study to establish credibility, transferability, and dependability. According to Weller et al. (2018), online surveys and interviews were methods utilized to achieve data saturation. Data saturation occurs in surveys and interviews because the data collected has high quality and quantity (Fusch et al., 2017). Achieving data saturation through surveys and interviews happen when standardized questions are utilized for each participant (Weller et al., 2018). This study utilized standardized survey and interview questions for each participant to achieve data saturation.

**Transition and Summary of Section 2**

Section two provides the reader with an overview of the project elements of the research presented. There are eight subsections to this portion of the research. These include the following: 1) purpose statement, 2) the role of the researcher, 3) description of participants, 4) research method and design, 5) population and sampling, 6) data collection, 7) data analysis, and 8) reliability and validity. Providing this information in this systematic format allows the reader to draw a direct link from the foundation of the research from the purpose statement to the reliability and validity components of the study.

The purpose of this study was to explore the relationship between external environmental conditions and construction project failures in countries of Northern Africa. The role of the researcher was to be responsible for participant selection, data collection, data analysis, setting forth the research conclusions, and uphold the germane ethical principles. Participants were
considered project managers employed by firms involved in construction projects in the region. Data collection was accomplished utilizing open-ended survey and interview questions. Data analysis was accomplished by separating information into two clusters such as successful construction projects and failed construction projects. Validity and reliability subsection developed the process of ensuring credibility, transferability, and dependability through triangulation and saturation of data.

Section 3: Application to Professional Practice and Implications for Change

Section three provides the reader with the project outcomes of the research presented. There are eight subsections to this portion of the research. These include the following: 1) overview of the study, 2) anticipated themes/perceptions, 3) presentation of findings, 4) application to professional practice, 5) recommendations for action, 6) recommendations for further study, 7) reflections, and 8) summary and study conclusions. Providing this information in this systematic format allows the reader to draw a direct link from the foundation of the research through the data collection and analysis processes to the final outcomes.

Overview of the Study

Construction project failure rates are higher than other types of projects (Gunduz & Yahya, 2015). Qazi et al. (2016) posited that construction projects were influenced by several external environmental conditions, have a higher level of complexity, and require more individual/specialized disciplines than other projects, which contributed to higher failure rates. Revealing these common external environmental conditions and influence drivers that contribute to construction project failures in North Africa may allow the development and utilization of risk management practices. The knowledge gleaned could assist firms and project managers to implement construction projects successfully.
Surveys and interviews of construction project managers that implemented construction projects in the region of Northern Africa were solicited and examined. The collected data assisted in exploring how external environmental conditions impacted construction projects. Data was collected via online surveys and interviews. Online surveys consisted of six standard questions ensuring consistency. Surveys contained open-ended questions with essay style answer blocks with no character/word counts. Essay style answer blocks allowed participants to provide deep contextual descriptions of experiences. A follow-up interview was also provided to participants to enhance the depth and breadth of the initial findings. Survey and follow-up interview questions with instructions are in Appendix A of this research. The findings of this research provide the external environmental conditions and influence drivers that negatively impact construction projects.

**Anticipated Themes/Perceptions**

Construction project management in the Northern Africa region presented specific challenges. Based on a review of the literature, the researcher of this study anticipated external environmental conditions may include negative risks associated with political power shifts, economic fluctuations, technological availability, environmental/seasonal changes, and legal bureaucracy. The anticipated influence drivers of these conditions included popular vote, outside political influences, monetary fluctuations, lack of skilled labor and equipment, extreme weather events such as droughts, high temperatures, dust storms and influences from local social groups. All these anticipated influence drivers and external environmental conditions are outside the control of the construction project manager and can impact projects negatively. Revealing the external environmental conditions that negatively influence construction projects allows project managers to develop better risk management approaches.
**Presentation of the Findings**

The presentation of findings section provides a thorough analysis of the survey and follow-up interview responses and the themes that emerged. This section also provides conclusions regarding emergent themes. The researcher contacted 147 participants, 32 firms in Morocco, 29 firms in Algeria, 35 firms in Tunisia, 19 firms in Libya, and 32 firms in Egypt. Of the surveys, 41 participants responded. The number of participants represented approximately 27.9% return rate on the survey. Of that 27.9% return rate, 30 participants fully completed the survey and follow-up interview processes. The 30 participants were further categorized by country. Participants provided data on several construction projects in multiple countries. The categorization breakdown includes eight participants in Morocco, eight participants in Algeria, five participants in Tunisia, six participants in Libya, and seven participants in Egypt. The data represented 46 projects with a total value of $1.5 billion. The purpose of this qualitative case study was to explore and describe the impacts between external environmental conditions, influence drivers, and construction project failures in countries of Northern Africa. The survey questions were based on the Traditional Project Triangle, DeLone and McLean concept, and Time-dependent model of construction project success based on the conceptual framework. The interview questions inquired about the risk management approaches and allowed the participants an opportunity to expand on the survey questions.

The Traditional Project Triangle suggests success is measured on whether a project is delivered within the defined scope, on time, and within budget (Pollack et al., 2018). The DeLone and McLean (2003) research focuses on the functionality and quality of the project deliverables. Quality and functionality being defined as a measure of whether the project met the intended use and satisfied the customer. Time-dependent model was adapted from Shenhar et al.
(2002). The Time-dependent model is based on a multifaceted conceptual framework that measures project success on four levels. These levels included project efficiency, customer impact, business success, and preparation for the future.

**Data Saturation and Triangulation.** The researcher’s role was to collect valid and reliable data. The collection of valid and reliable data was achieved through data saturation and triangulation. According to Fusch and Ness (2015), researchers agreed that data saturation occurred when no additional data can be collected to develop properties from the emergent themes. Using this definition of data saturation, when common themes emerged from the participant surveys, but no properties from additional themes emerged, then data saturation has been achieved. The study achieved data saturation with 30 participants from the five countries that make up the region of Northern Africa.

Data triangulation is the use of more than one method to collect data to develop a thorough understanding of the research subject (Creswell & Poth, 2018). Data triangulation includes collecting information from multiple individuals (Creswell & Poth, 2018). Data triangulation was accomplished by analyzing what participants from this research reported compared to the current literature regarding the subject of construction project failures.

Anderson and Holloway-Libell (2014) posited that triangulation for data validity occurred when collected data in current research corresponds with previous literature. The selected participants of this study encountered and discussed influence drivers of external environmental conditions that negatively impacted the construction projects. There was also current literature about common factors that contributed to construction project failures. The negative influence drivers that led to external environmental conditions were also found in the
research findings and corresponds with previous literature, which lends to the validity of this study (Anderson and Holloway-Libell, 2014).

**Data Collection Process.** The researcher provided an online survey via hyperlink upon successfully contacting each participant. Instructions ensured the participants understood that construction projects in the region of Northern Africa was the primary focus. Participants were instructed to contemplate about their various construction projects which the individual had direct and significant knowledge to answer all survey questions regarding the construction project. Participants were provided an explanation that for the purposes of answering the survey, answers should be focused on construction projects that were negatively impacted by external environmental conditions. The chosen construction projects shall also be considered a failure based on the Traditional Project Triangle, DeLone and McLean concept, and Time-dependent model.

Follow-up interviews were conducted with the participants to explore the risk management approach exercised by the construction project manager. The interview process also allowed participants an opportunity to provide additional data on the previous survey questions. Both surveys and follow-up interviews conducted explored the topic with open-ended questions. The answers were correlated into emergent themes that provided depth and breadth on the research topic. Instructions and questions for the surveys and follow-up interviews are attached to this study in Appendix A.

**Emergent Themes.** The next several paragraphs explore the contextual relationships that emerged from the participant surveys and follow-up interviews. These contextual relationships were coded into emergent themes that answer the research question. The research question asks,
“What are the external environmental conditions that negatively impact construction projects in Northern Africa?”

Emergent Theme 1: Technology. Construction projects are well-known for technological challenges, which is a commonly cited source of an external environmental condition (Ntuli & Allopi, 2014; Okoli et al., 2018). Osabutey and Jin (2016) posited that suitable construction technology was critical and needed to be analyzed according to the following: the availability of equipment which can be procured locally, the availability and capacity of local construction material, and resources with specialized construction skills. The following paragraphs explore Participants 4, 6, 7, 8, 12, 13, 18, 20, 22, 23, 25, 27, and 28 experiences of how technology emerged as a theme.

Participant 4 offered data related to the emergent theme of technology. The participant discussed executing a construction project with an inexperienced workforce. Participant 4 stated:

We worked a construction project to build an oil loading facility at a port. The scope was not defined and low bid subcontractors install standard (gallon) measuring equipment when liter measuring equipment was needed. The project needed to be retrofitted to be completed. This busted the budget and schedule. (Participant 4, personal communication, July 8, 2020)

In this case, a lack of experience with the workforce caused the construction project to fail by not meeting the functionality of the requirements. Participant 4 explained that, “We install [sic] the wrong measuring devices on the oil loading facility” (Participant 4, personal communication, July 8, 2020). The scope was not defined and the construction project manager did not request for clarification. This is an example of a technological challenge from a lack of knowledge and experience. Installing the incorrect measuring devices was a scope discrepancy
that required a retrofit resulting in negative impacts to the project budget, schedule, and customer satisfaction. Participant 4 stated during a follow-up interview that the negative risk was managed by acceptance that required additional costs and time to correct the functional requirements of the construction project (Participant 4, personal communication, August 17, 2020).

Participant 6 provided data on the emergent theme of technology as an external environmental condition that negatively impacted construction projects. The participant stated, “PM decision making is a problem in Libya. This leads to a loss of project funds on projects. PMs should have experience working on construction projects of particular size and scope. An apprenticeship can resolve these issues” (Participant 6, personal communication, July 9, 2020). The participant provided additional data on the outcome of not having an experienced construction project manager, “The construction project was delivered late, the scope doesn't fit the need...there are a number of reasons....most often, the scope doesn't fit the need” (Participant 6, personal communication, July 9, 2020). In this instance, the participant highlighted a scope deficiency. During a follow-up interview, Participant 6 recommended adequate training and experience of a construction project manager to mitigate this negative risk as much as possible (Participant 6, personal communication, August 21, 2020).

Participant 7 indicated there were influence drivers associated with the emergent theme of technology that negatively impacted a construction project in Libya. Participant 7 stated, “In Libya, there is a heavy migrate labour force that is trying to get to Europe. Workers are hired and move on once paid. This means additional labourers need to be hired resulting in slowing the construction project” (Participant 7, personal communication, July 9, 2020). The participant provided additional comments, “Recruiters needed to find labor and transport them to the project site. Labor is expected to be fed and paid. Feeding these individuals costs more than budgeted”
Participant 7 also stated that schedule delays and additional costs were incurred due to the influence driver of a migratory workforce. The negative risk impacts also included construction project budget impacts caused by additional housing and feeding the labor force. The construction project manager mitigated this risk by hiring recruiters to fill the need of project site labor. The participant also stated, “The scope validation processes were not followed to ensure the customer was in agreement” (Participant 7, personal communication, July 9, 2020). The participant suggested that there was a lack of training and experience in the project delivery team. During a follow-up interview, Participant 7 stated, “These risks were mitigated through using contingency funds to rework the scope to fit the project functionality requirements. The issue with the migratory labor force was mitigated by using the management reserve” (Participant 7, personal communication, August 21, 2020).

Participant 8 offered data related to the emergent theme of technology by providing data related to a lack of an experienced workforce. Participant 8 stated:

In Egypt there is a lack of experience. Workers need to be trained which delays the project. PMs and construction managers often train the workforce to place concrete, electrical and mechanical systems. Inexperienced workers conduct civil work such as ground leveling and material clean up (Participant 8, personal communication, July 9, 2020).

The participant provided additional data, “A lack of contractor commitment and inefficient site management can kill the project budget. The lack of contractor’s commitment and inefficient site management means scope changes are not incorporated and the customer requirements are not achieved” (Participant 8, personal communication, July 9, 2020). The negative risk impacts from a lack of experience and not meeting the scope requirements were
similar to Participant 7’s comments. Participant 8 included additional data during a follow-up interview about the risk management approach to address this issue, “Mitigation through training, training is often utilized to enhance the workforce knowledge. This does require an investment of time and money but it moves the project in the right direction” (Participant 8, personal communication, August 17, 2020). If the construction project manager and construction managers were training the workforce as work was progressing, schedule delays could have been incurred. Likewise, additional costs could have been incurred, because of schedule delays, but the project was delivered within scope.

Participant 12 provided data on the emergent theme of technology. The participant stated, “The workforce typically needs to be supervised for the entirety of the project. They are unfamiliar with technical requirements of modern road construction, oil transfer systems, concrete placement, and etc [sic]” (Participant 12, personal communication, July 8, 2020). Participant 12 also provided, “If the project does not meeting [sic] the functional requirements, the organization has two options. Modify the newly completed project or change strategies. Normally, the completely [sic] deliverables are modified to fir [sic] the strategy” (Participant 12, personal communication, July 8, 2020). During the follow-up interview Participant 12 stated, “risks are mitigated through guiding the labors via close supervision. Contingency funds are included as part of the bid packages to pay for additional supervisors” (Participant 12, personal communication, August 20, 2020). Participant 12’s approach ensured the project scope was delivered, had defined elements of quality, and functioned as designed.

Participant 13 provided data on the emergent theme of technology. The participant stated, that the workforce was poorly trained and did not know the proper construction methods for large projects (Participant 13, personal communication, July 9, 2020). This resulted in the project
deliverables having poor quality and did not meet the functional requirements (Participant 13, personal communication, July 9, 2020). During a follow-up interview, the participant stated, “Risks were mitigated through training the workforce. This did impacted [sic] the project schedule and the budget” (Participant 13, personal communication, August 21, 2020).

Participant 18 provided data on the emergent theme of technology. The participant stated, “In Algeria, international contractors do not possess any practical experience or knowledge of the local construction industry and culturally [sic] different environment this delays the projects” (Participant 18, personal communication, July 13, 2020). The participant stated that the project did not function (Participant 18, personal communication, July 13, 2020). In a follow-up interview Participant 18 stated, “Training assists in mitigating a lack of experience risk condition [sic]” (Participant 18, personal communication, August 19, 2020). In this case, the construction project manager needed to mitigate this risk through educating the workforce. Additional training efforts would have impacted the project budget and could have potentially impacted the schedule.

Participant 20 expanded on the emergent theme of technology as an external environmental conditions. Participant 20 stated, “Yes, the project failed to be delivered on schedule. There were multiple causes such as availability of materials, transportation for materials and labor, availability of subcontractors” (Participant 20, personal communication, July 10, 2020). A lack of material and transportation could be considered a representative of a technological issue. Participant 20 stated that the project failed to be delivered on schedule related to these negative risks. Participant 20 provided additional comments on a follow-up interview:
In hindsight, instead of accepting the risks of material delays and labor shortages, an [sic] alternate sources should have been sought such as local materials and imported [sic] labor. This would have mitigated the risks described or lessen the impacts to projects [sic] schedule and budget (Participant 20, personal communication, August 17, 2020).

In this instance, Participant 20 stated that during the time of the risk occurrence, the negative risk associated with the influence drivers were accepted. However, after reconsidering the risk management approach, mitigation would have been a more appropriate response.

Participant 22 offered data related to the emergent theme of technology. The participant stated, “technical and administrative staff employed were not experienced” (Participant 22, personal communication, July 11, 2020). The participant also provided the following data, “The functional or space diagrams that illustrated the project requirements were not clear and the shareholder was not available to answer questions” (Participant 22, personal communication, July 11, 2020). In this case, the negative risk impacts from a lack of experience, which means training the workforce was required. During a follow-up interview, the participant suggested that the negative risk was managed through training efforts (Participant 22, personal communication, August 17, 2020). The risk management approach used was related to risk mitigation. The negative risk and risk management approach led to schedule delays and additional costs.

Participant 23 provided data on the emergent theme of technology as an external environmental condition that negatively impacts construction projects. The participant stated, “The construction knowledge was lacking. The PM needed to hire additional trainers to assist the workforce with concrete and walls and roofing” (Participant 23, personal communication, July 11, 2020). The participant also added, “The functional requirements were not defined in the contract” and “The project failed because of a lack of communication. The organizational
strategy was not communicated to the PM, design team or construction agent” (Participant 23, personal communication, July 11, 2020). In this case, the project manager outsourced training to trainers. These trainers negatively impacted the project budget and the deliverables did not meet the intended purpose of the shareholders (Participant 23, personal communication, July 11, 2020). The participant suggested during the follow-up interview that the construction project schedule was impacted by training related to work activities (Participant 23, personal communication, August 19, 2020). Similar to Participant 22, the construction project manager exercised a risk mitigation approach by training the workforce (Participant 23, personal communication, August 19, 2020).

Participant 25 provided data associated with the emergent theme of technology as an external environmental condition. The participant stated, “A common cause[sic] of construction project delays is the contractor failures to execute certain items properly” (Participant 25, personal communication, July 11, 2020). The participant provided additional data by explaining, “Re-work is a common construction phase in Libya” and “After an exhaustive rework effort, the project did meet the functional requirements” (Participant 25, personal communication, July 11, 2020). The participant further explained that the customer was satisfied with the project deliverables, but was unsatisfied with the schedule delays and additional costs (Participant 25, personal communication, July 11, 2020). According to a follow-up interview, the participant explained that training would mitigate the majority of re-work issues (Participant 25, personal communication, August 18, 2020).

Participant 27 provided data on the emergent theme of technology as an external environmental condition that negatively impacts construction projects by offering the following comments, “There was only one supplier and it took time to deliver the components. The weight
and scarcity of the hydroelectric components required special fabrication and delivery” (Participant 27, personal communication, July 11, 2020). The participant provided additional data by stating:

Fabrication, delivery and installation of the specialized components required additional costs and time. The initial cranes rented by the subcontractor were no [sic] sufficient to safely lift the component. The PM was required to subcontract with another firm to offload the components (Participant 27, personal communication, July 11, 2020).

In this case, the construction project manager only had one supplier to deliver components. This could have negatively impacted the project schedule if the construction project manager did not anticipate this risk. Likewise, the lack of competition from having only one supplier could have led to higher prices. The participant provided additional comments in a follow-up interview by stating, “Better planning and scenario exercises would have mitigated this risk better. This did not occur so we had to accept the risk and consequences” (Participant 27, personal communication, August 19, 2020). In this instance, Participant 27 stated that during the time of the risk occurrence, the negative risk associated with the influence drivers were accepted. However, after reconsidering the risk management approach, mitigation would have been a more appropriate response.

Participant 28 suggested an approach to mitigating influence drivers associated with technology as an external environmental condition. The participant stated:

The availability of experienced contractors and materials is a major delaying factor. When the economy is booming, these resources are in high demand. Likewise, if the work is highly specialized. If these resources are not secured early in the contract
(retainer), the project could be significantly delayed (Participant 28, personal communication, July 10, 2020).

Participant 28 suggested the utilization of a retainer to secure specially trained workers to perform complex tasks. A retainer could have mitigated negative risks from a lack of specialized workers and avoided construction project schedule delays. Retaining a specialized workforce could have also increased the overall project costs if not budgeted properly. This could have also increased the contract bid amount. Participant 28 stated during a follow-up interview, “Mitigation through retaining specialized workers assisted with schedule delays but costed [sic] more than budgeted. However, there was more emphasis (on this project) on the scheduled delivery than budget” (Participant 28, personal communication, August 18, 2020). The participant appeared to have established a success criteria based on schedule delivery more than budget.

**Technology and previous research.** Osabutey and Jin (2016) viewed technology and knowledge transfer factors as part of the external environment that must be examined when developing strategic plans in Sub-Saharan nations of Africa. Osabutey and Jin (2016) posited that suitable construction technology was critical and needed to be analyzed according to the following 1) the availability of equipment which can be procured locally, 2) the availability and capacity of local construction material, and 3) resources with specialized construction skills. Studies revealed that higher technology levels were directly proportional to construction project success (Osabutey & Jin, 2016; Sturman, 2020; Windapo, 2018). Construction project managers should examine available technology as an external environment factor that influences negative and positive risk (Project Management Institute, 2017).
Ntuli and Allopi (2014) posited that construction training, knowledge, and experience were required to implement construction projects. The lack of construction education appeared to be one of the major hurdles in Africa (Ntuli & Allopi, 2014). New entrants into the construction market need to be developed through construction related education (Osabutey & Jin, 2016). Likewise, the communication skills to transfer construction skills to the labor force are vital (Windapo, 2018).

The complexity of the construction project requirements as well as work activities enhanced negative risk opportunities (Qazi et al., 2016). Qazi et al. (2016) suggested that the effects of these negative risks led to poor project execution resulting in schedule delays, costs associated with rework, and low quality. Okoli et al. (2018) established that the availability of skilled resources was a predictor construction project performance with complex requirements. Okoli et al. (2018) also stated that the availability of technology needed to be considered, in order to maintain successful project deliverables.

Technology and conceptual framework. Larson and Gray (2018) defined the Traditional Project Triangle as the successful management of project scope, schedule, and cost while managing project risks. The DeLone and McLean (2003) focuses on project quality, system functionality, and user satisfaction. The Time-dependent model measures project success based on project efficacy, customer impact, business success, and preparation for the future (Shenhar et al., 2002). These constraints influence the entire project lifecycle from the initiation through the close-out to include the future preparedness of the firm.

Participants in the emergent theme of the technology described negative impacts based on elements from the three project management concepts represented in the conceptual framework. These elements were project scope, schedule, budget, quality, satisfaction, customer impact, and
functionality. According to Ntuli and Allopi (2014), construction experience, knowledge, and training were required to implement construction projects successfully. The interaction between construction projects and technology influence drivers add layers of uncertainty as an external environmental condition. These technology influence drivers can negatively impact the construction project outcomes if risks were not managed effectively.

Five influence drivers were revealed within the emergent theme of technology. Participants described the influence drivers of the emergent theme of technology as a shortage of trained labor, managerial inexperience, labor instability, shortages of material, and lack of transport. Participants described issues with meeting the project requirements as well as customer satisfaction and customer impact issues. Based on the data collected, the construction project manager would research the available technology within the region to adjust the scheduling and budgeting components based on data collected. Managing technology availability across these constraints assists with managing negative risk and enhances the probability of construction project success. These actions would be considered critical during the planning and executing project activities to heighten the probability of construction project success.

**Emergent Theme 2: Legal Bureaucracy.** Construction projects are well-known for complex legal influences, which is a commonly cited source of an external environmental condition (Kaminsky, 2019; Kock & Gaskins, 2014; Ocheje, 2017). Kaminsky (2019) defined legal bureaucracy as an interrelationship between construction firms and legal systems operated by governmental authorities. The following paragraphs explore participants 4, 5, 9, 11, 12, 16, 17, 29, 32, 35, and 36’s experiences of how legal bureaucracy emerged as a theme.

Participant 4 provided data associated with the emergent theme of legal bureaucracy as an external environmental condition. The participant indicated the external environmental
condition negatively impacted a construction project in Tunisia. Participant 4 stated, “Tunisia construction projects face corruption. To solve this, the government began a number of cases against the parties involved, leading to ten-year sentences for representatives of several companies” (Participant 4, personal communication, July 8, 2020). Participant 4 continued with the following statement, “A Construction PM faces corruption and extortion in order to operate in Algeria. This is often budgeted into the overall project costs. This can make competitive bidding for contracts difficult” (Participant 4, personal communication, July 8, 2020). Participant 4 confirmed during a follow-up interview that corruption and extortion risks were managed by acceptance through budgeting for these additional costs (Participant 4, personal communication, August 17, 2020). The risk acceptance approach with a fallback plan of budgeting for corruption and extortion would have impacted the overall construction project costs.

Participant 5 provided data associated with the emergent theme of legal bureaucracy as an external environmental condition. The participant provided the following, “The Libyan's [sic] low bid contracts without evaluating experience. Nepotism and corruption hinders the construction projects” (Participant 5, personal communication, July 10, 2020). Participant 5 provided additional comments, “Oil construction projects are complex and the Libyan firms rely on social class and nepotism to manage projects to a point of failure. Then, outside contractors from Europe or South Africa are hired to manage the sites” (Participant 5, personal communication, July 10, 2020). During a follow-up interview, Participant 5 indicated that the negative risk of corruption is accepted and does impact the project costs as well as customer satisfaction (Participant 5, personal communication, August 19, 2020). The risk acceptance approach with a fallback plan of budgeting for nepotism and corruption would have impacted the overall construction project costs and stakeholder satisfaction.
Participant 9 provided data associated with the emergent theme of legal bureaucracy as an external environmental condition. The participant provided the legal requirements for construction firms operating in Egypt. The legal requirements appeared complex and required the submission of applications and approval before construction projects are authorized.

Participant 9 stated, “That local authorities are committed to preventing any construction firms from implementing construction projects without registering with the construction federation” (Participant 9, personal communication, July 8, 2020). Additional data was also provided by Participant 9:

There are many legal requirements for an international firm to conduct work in the region. This can delay construction projects. For instance, contractors must register at the Egyptian Federation for Construction & Building Contractors to execute any activity related to construction and contracting in Egypt. The unregistered act of executing said activity is punishable under the Egyptian law (Participant 9, personal communication, July 8, 2020).

Participant 9 provided additional data:

decades [sic] of substandard management and little accountability/oversight has led to the failing within the construction industry. For instance, there has been a recent spate of collapsing buildings which reveals this weak infrastructure. March 13 in Alexandria, a wall still under construction collapsed onto a coffee shop killing six people and injuring seven. March 19, a 6-story building collapsed in Nasr City, Cairo killing 13 families. March 21, a 3-story building collapsed in Giza, killing 2 and injuring 5. In Suez, a portion of a building also fell, injuring a child. March 30, a 4-story building collapsed in Cairo, killing 2 and injuring others (Participant 9, personal communication, July 8, 2020).
According to these statements, Participant 9 has suggested that construction firms would be shut down if not registered. To overcome this, the construction project manager would be responsible for registering the construction firm before the contract bidding process. Participant 9 included an additional comment about meeting project requirements and organizational strategy, “If a customer cannot occupy the new building that was contracted, how can the organization achieve its strategy?” (Participant 9, personal communication, July 8, 2020).

The participant suggested that being registered does not ensure project quality and functionality is achieved. Participant 9 stated, “Laws and regulations exist within the construction industry, the collapse of these structure [sic] indicates that guidelines are not being enforced. These leaves [sic] the customer/stakeholders with questionable assurances about the final construction deliverables” (Participant 9, personal communication, July 8, 2020). Participant 9 provided additional details during a follow-up interview that this negative risk was mitigated by taking steps to register the firm and following the regulations established by Egyptian law (Participant 9, personal communication, August 17, 2020).

Participant 11 provided data associated with the emergent theme of legal bureaucracy as an external environmental condition. The participant included several examples of influence drivers that caused construction project delays. Participant 11 stated, “Many construction projects suffer schedule delays. It is common to discover that there are excessive subcontracting (corruption), delay in obtaining permits from governmental agencies (bureaucracy, extortion, and corruption)” (Participant 11, personal communication, July 8, 2020). The delays in obtaining permits from governmental agencies due to several of the listed reasons was a negative risk. Participant 11 provided additional data during the follow-up interview, “excessive subcontracting (corruption) risk is accepted in the region. In some cases, the costs are transferred
to the supplier or stakeholder on government funded projects” (Participant 11, personal communication, August 17, 2020). In this instance, Participant 11 suggested that the commonality of bureaucracy, extortion, and corruption were transferred as part of the project risk management approach on government projects.

Participant 12 provided that legal bureaucracy as an emergent theme within the region. The participant stated:

Construction delays in Libya has become an epidemic. Libya is still struggling to recover from the conflict of 2011. As far as construction goes, international oil companies have resumed operations. However, the oil industry (construction specifically) has new challenges, such as security issues, deregulated market, vulnerable legal framework and lack of a central governing power. These cause tremendous delays to future and ongoing construction projects. A PM needs to weigh each risk both qualitatively and quantitatively to ensure schedules are competitive to bid for contracts but not too conservative to loss [sic] contracts (Participant 12, personal communication, July 8, 2020).

A deregulated market, vulnerable legal framework, and lack of a central governing power could be indicators of influence drivers that cause negative risks associated with the external environment of a construction project. The participant provided additional comments about the potential negative impacts. The participant stated:

Project delays lead to budgetary overruns such as arbitration between contractual parties. Some stakeholders do not accept a mediator’s decision and will appeal in an arbitration process (legal requirements). If this happens, construction projects incur additional costs
and time engaging with professional arbitrators (Participant 12, personal communication, July 8, 2020).

In this case, the construction project manager would need to rely on the management reserve to litigate issues. The project management reserve is defined as the budgetary or schedule reserve used to manage unidentified risks. The management reserve would have been estimated based on the potential risk of the construction project. Participant 12 provided the additional comments about meeting the project requirements, “Slow change management and financing. Changes may be approved but the financing does not materialize. Leaving [sic] the PM to follow the original scope of work” (Participant 12, personal communication, July 8, 2020). Participant 12 provided additional comments during the follow-up interview about the risk management approach, “We try to mitigate as much as possible. For the external environment conditions, engaging and communicating risks with stakeholders is needed on a regular basis” (Participant 12, personal communication, August 19, 2020).

Participant 16 provided data associated with the emergent theme of legal bureaucracy as an external environmental condition. The participant included a varied response and explained that construction project failures were due to various reasons. The participant indicated, “Environmental restrictions, Changes [sic] in government regulations and laws, Slow [sic] permit by government/municipality” (Participant 16, personal communication, July 14, 2020). Participant 16 highlights influence drivers associated with the emergent them of legal bureaucracy. These are changes to governmental regulations and laws and slow permitting by government/municipalities (Participant 16, personal communication, July 14, 2020). Participant 16 explained that nearly any of the influence drivers mentioned have negative schedule and cost
impacts. The participant provided additional data during the follow-up interview on risk management:

Regulatory delays are accepted risks. Experience with the permitting processes ensures schedules and budgets do not get skewed because of delayed permits. Mitigation efforts include conducting permitting right after contract award to initiate the regulatory process. Then, the permitting process is allowed to work through the various regulatory offices while the project is being planned (Participant 16, personal communication, August 17, 2020).

The participant also included, “anytime there are issues with schedule, budget or functionality, there will be customer issues” (Participant 16, personal communication, August 17, 2020). It was also expressed that the participant was unaware of the organizational strategy the customer was trying to achieve with the construction project (Participant 16, personal communication, August 17, 2020). Participant 16 comments suggested that while regulatory delays were accepted in this case, mitigation efforts were implemented to ensure the negative risk was managed.

Participant 17 provided comments on the emergent theme of legal bureaucracy. The participant stated, “A contractual dispute, claim or litigation can lead to project failure and total abandonment and a loss of project funds. In the past, until these issues were resolved, the workforce would refuse to work” (Participant 17, personal communication, July 8, 2020). The participant explained, “The construction project was time-based. When it was not delivered on schedule the project was considered a failure” (Participant 17, personal communication, July 8, 2020). Participant 17 further explained that claims were initiated by an unsatisfied customer when the project was not delivered on schedule (Participant 17, personal communication, July 8, 2020). In this case, the construction project undergoing litigation impacted the overall project
with total abandonment. In a follow-up interview, Participant 17 provided, “All PMs should avoid litigation. This may cut into profits but at least the project continues to move forward” (Participant 17, personal communication, August 16, 2020). The risk management approach utilized by Participant 17 was avoidance.

Participant 29 provided data associated with the emergent theme of legal bureaucracy as an external environmental condition. The participant provided a specific example:

In Algeria, The [sic] national authorities have launched several initiatives to combat desertification because 30 provinces remain threatened by desertification. The environmental regulatory rules change from municipality to municipality (965 municipalities) in these 30 provinces. These changes from place to place are similar but requirements change and need to be studied before project implementation (Participant 29, personal communication, July 9, 2020).

The participant suggested that environmental regulatory rules in these municipalities should be examined to minimize potential negative impacts. Participant 29 provided additional information during a follow-up interview, “We accept the risks of regulatory impacts. We just work with the local authorities as much as possible to develop relationships. These relationships assist with getting paperwork approved” (Participant 29, personal communication, August 17, 2020).

Participant 32 provided data associated with the emergent theme of legal bureaucracy as an external environmental condition. The participant stated, “there was a delay in permits from the local authorities” (Participant 32, personal communication, July 9, 2020). The participant added that, “additional costs were required to process permits” (Participant 32, personal communication, July 9, 2020). The participant also included, “The organizational strategy was
not communicated with the project team. If it had, the project may have had a better focus on delivery” (Participant 32, personal communication, July 9, 2020). The participant suggested that schedule delays and additional costs were incurred due to processing construction permits. During a follow-up interview, the participant provided that the risk management approach was acceptance (Participant 32, personal communication, August 19, 2020).

Participant 35 provided data associated with the emergent theme of legal bureaucracy and several examples of influence drivers that negatively impacted construction projects in Northern Africa. The participant stated, “In Morocco and Tunisia, the average dispute took 6-15 months to reconcile. Other type of delays included changes [sic] orders, financial problems, adverse weather, supplier delays, poor design, lack of experience or unforeseen site conditions. All have impacts on the scope, schedule and budgets which in turn affects functionality and customer satisfaction” (Participant 35, personal communication, July 9, 2020). Participant 35 provided additional comments during a follow-up interview on risk management approaches for these influence drivers:

It depends on the context of the risk. Supplier issues are mitigated by ordering long lead items as soon as possible. Training is conducted on the job site to train labours. Weather is an accepted risk. Disputes with local officials are avoided (Participant 35, personal communication, August 18, 2020).

The participant provided various risk management approaches that were context dependent based on the influence driver.

Participant 36 provided a single example of legal bureaucracy as an emergent theme. Participant 36 stated, “Egyptian Building Co. Dig permits took a long time and delayed the project” (Participant 36, personal communication, July 11, 2020). The participant provided
additional data, “Needed to pay incentives to process paperwork with local authority. This was not planned in the project budget” (Participant 36, personal communication, July 11, 2020). The responds was similar to data provided by other participants that discussed the emergent theme of legal bureaucracy as an external environmental condition. In this case, the construction project manager approached project delays by paying incentives to process construction documents. During a follow-up interview, Participant 36 stated that the construction team exercised an acceptance approach to manage the negative risks from the influence driver (Participant 36, personal communication, August 19, 2020).

**Legal bureaucracy and previous research.** Construction permitting is important for the operation of modern society as it regards to enabling basic social and industrial needs. There appeared to be an emergence of instances where a two-tier governing system occurs within the region. The first-tier could be identified as regional and central municipalities. The second-tier could be identified as a local self-governing system. The emergent theme appeared to be focused on the second-tier systems that were localized self-governing systems. Complex legal bureaucracy was an influence driver that could have led to negative risks associated with the external environment. Kaminsky (2019) defined legal bureaucracy as an interrelationship between construction firms and legal processing systems operated by governmental officials. For example, a construction permit is an official approval issued by localized governmental authorities that allow a contractor to implement a construction project. The intent is to ensure that the construction project plans comply with local standards. These local standards are intended to ensure the safety of occupants/operators and to provide zoning enforcement and land-use policies. Specific instances of the construction permitting process may include authorization to approve structural integrity, sanitation, water, fire protection, and electrical
services (Kaminsky, 2019). Using this definition, the legal system serves the community. The definition offered by Kaminsky (2019) fits many situations found in the data collected from the participants about the construction projects in the region of Northern Africa. The influence driver for this definition would be considered the legal processes presented by local governments before the construction project was executed.

Ocheje (2017) offered additional information as an influence driver associated with legal bureaucracy. Ocheje (2017) posited that corruption in Africa was identified as an influence driver associated with legal bureaucracy that hinders efforts to execute construction developmental projects. According to Treisman (2007), government corruption was defined as the use of public office or power for personal gain. The research continued by suggesting that Sub-Saharan African nations had more government corruption than more developed nations (Treisman, 2007). Governmental corruption has a tendency to lead to misallocation of financial resources resulting in negative risks for construction project efficiency (Araral et al., 2019). Corruption also tended to prevent or reduce investment capital by foreign firms (Knutsen et al., 2017). The influence driver for this definition would be considered the corruption presented by local governments and contractors before and during the construction project.

The act of undertaking and constructing a project has many complexities that can lead to legal disputes (Barman & Charoenngam, 2017). Legal disputes arise from the perception of a breach of contract that leaves legally bound stakeholders dissatisfied with construction project deliverables. Disputes required the assistance of adequate legal representation to assist the various stakeholders through the process of resolution (Saleh, 2019). The causes vary such as payment issues, scope deficiencies, unexpected repairs, schedule alterations, poor quality, or failure to meet functional requirements (Barman & Charoenngam, 2017; Saleh, 2019).
According to Barry and Leite (2015), in order to manage the influence driver of legal disputes, the construction project manager must fully comprehend the contractual documents, understand the full range of deliverables and the associated impacts to the overall completion of the project. The influence driver for this definition would be considered the legal disputes that impact the construction project.

**Legal bureaucracy and conceptual framework.** Legal bureaucracy is a condition outside of the construction project manager’s control but affects the project to varying degrees (Liu et al., 2019). Larson and Gray (2018) defined the Traditional Project Triangle as the successful management of project scope, schedule, and cost while managing project risks. The DeLone and McLean (2003) model focuses on universal factors that can be applied to all projects. These factors include project quality, functionality, and user satisfaction. The Time-dependent model measures project success based on project efficacy, customer impact, business success, and preparation for the future (Shenhar et al., 2002). These constraints influence the entire project lifecycle from the initiation through the close-out to include the future preparedness of the firm.

Participants in the emergent theme of legal bureaucracy described negative impacts based on elements of the three concepts represented in the conceptual framework. These elements were project scope, schedule, budget, quality, functionality, satisfaction, customer impact, and preparation for the futures. Three influence drivers were revealed in the emergent theme of legal bureaucracy as corruption, permitting processes, and legal disputes. Based on the data collected, the construction project manager would adjust the scope, scheduling, and budgeting constraints to manage the influence drivers of corruption, permitting processes, and legal disputes. Managing the equilibrium across these constraints concerning construction project success would be considered critical while undertaking the project performance objectives established by the
stakeholders. These actions could reduce the possibility of construction project failure due to legal bureaucracy.

**Emergent Theme 3: Political Economy.** Construction projects are well-known for political economy challenges, which is a commonly cited source of an external environmental condition (Adeleke et al., 2018). According to Adeleke et al. (2018), politics and economic systems are interwoven and create an interaction called political economy. The following paragraphs explored Participants 2, 3, 4, 5, 10, 13, 19, 26, 28, and 30 experiences of how the political economy emerged as a theme.

Participant 2 provided data associated with the emergent theme of political economy as an external environmental condition. The participant indicated there were influence drivers that negatively impacted construction projects in Algeria and Morocco. Participant 2 stated, “Algeria and Morocco have ordered sweeping travel restrictions and quarantine measures. This has slowed the completion of several projects. Also, leading to a labor and material shortage” (Participant 2, personal communication, July 11, 2020). Beginning in 2019, the world was impacted by a pandemic from coronavirus (COVID-19) (Velavan & Meyer, 2020). In order to quell the spread of COVID-19, world governments enacted various social distancing measures. These measures ranged from wearing masks to the shutting down of non-essential activities to requiring self-quarantining in an individual’s domicile. These measures for COVID-19 also negatively impacted world economies as governments attempted to stave-off the spread of the disease. The participant also included, “Projects experiencing shutdown due to the COVID required addition management reserves to be executed. Project completion estimates have increased by 5-20%” (Participant 2, personal communication, July 11, 2020). During the follow-up interview the participant stated that the construction project manager accepted the risk
associated with this influence driver by utilizing the project management reserves to offset the additional 5-20% project costs (Participant 2, personal communication, August 17, 2020).

Participant 3 provided data associated with the emergent theme of political economy as an external environmental condition. Participant 3 stated:

The Morocco economic shutdown has impacted the completion of several projects. All projects scheduled for the 2020 building season will be late. Restarting a project from a shutdown requires additional investments such as hiring new sub-contractors, labor force and construction managers (Participant 3, personal communication, July 8, 2020).

The participant provided additional comments, “The economic shutdown of Morocco will require additional investments to complete. Many in the construction workforce were laid off. A new labor pool will need to be hired. This requires an investment of time and dollars” (Participant 3, personal communication, July 8, 2020).

During a follow-up interview Participant 3 stated, risks associated with economic shutdown were accepted because there were no contingency plans established for this risk (Participant 3, personal communication, August 19, 2020). The restarting of a construction project from a shutdown would require additional capital as well as negatively impacting the schedule. The project manager expressed that the influence driver caused a negative risk occurrence that was accepted.

The participant provided data in a second example. Participant 3 explained that changes in political leadership can mean a change in national strategy (Participant 3, personal communication, July 8, 2020). The participant included:

This can mean failure for a construction projects even if the scope, budget and schedule are met. Construction projects that have many changing scopes or customer leadership
changes means high risk. A turnover in customer/organizational leadership could mean that the firm is moving in a different direction than the previous leader. This means that a construction project can be easily abandoned until a re-purpose can be undertaken (Participant 3, personal communication, July 8, 2020).

During a follow-up interview, Participant 3 stated, risks associated with leadership changes in the political economy were mitigated (Participant 3, personal communication, August 19, 2020). This was an effort to mitigate changes in the scope and the functionality of the project. The participant stated during the follow-up interview that this was accomplished by the following actions, “We encourage customers to solicit subject matter experts to guide the organization during the scope definition phases” (Participant 3, personal communication, August 19, 2020). In these two examples, the participant expressed that the influence drivers of the political economy were managed through risk acceptance and mitigation approaches.

Participant 4 provided data on the emergent theme of political economy as an external environmental condition offering the following comments:

Algerian government is switching away from dependency on oil. This meant that the criticality of the construction project changed and political support was lost. Without the political support in Algeria, a project has higher risks of failure because the government controls major projects (Participant 4, personal communication, July 8, 2020). The data offered by Participant 4 provided insights on how the political economic changes can impact construction projects.

Participant 4 confirmed during a follow-up interview question that the political economic changes were managed by acceptance (Participant 4, personal communication, August 17, 2020).
This impacted the scope of the project and budget. The scope and the budget was reduced (Participant 4, personal communication, August 17, 2020).

Participant 5 provided comments on the emergent theme on how the political economy impacts construction projects. The participant stated:

Libyan construction projects nearly always deviate from planned timelines and financial estimates. The country struggles to recover from the conflict in 2011. There are two different governing powers and both are dependent on the access to the 48 billion barrels of oil (Participant 5, personal communication, July 10, 2020).

Participant 5 provided additional data during a follow-up interview, “the risk was accepted and the contract was terminated” (Participant 5, personal communication, August 16, 2020). The Libyan political conflict negatively impacted ongoing and planned construction projects. In this case, force majeure due to war would have been a reasonable conclusion to terminate a construction project.

Participant 10 offered several influence drivers related to the emergent theme of the political economy negatively impacting a construction project. The participant stated:

There was a revolution in January 2011 and its effects, security chaos, curfews, bank closures and supply chain delays. External: Official holidays. There are numerous holidays. Construction work cannot start and stop without lag; events often delay construction project 180 days. These 180 days need to be accounted for in the project schedule (Participant 10, personal communication, July 9, 2020).

Participant 10 also provided additional data on the emergent theme of the political economy:
Fluctuations in cost/currency drastically shift construction project budgets. Best to work cost plus contracts which are rare in Egypt. This secures a profit margin of 5-7% for the executing agent. On Government projects, Stakeholders seem disengaged as project progress. Scope changes are not addressed and the functional requirements are not met. The PM has to actively pursue stakeholders and ensure changes are authorized and the project is delivered with a current scope that fits the functional requirements. Bank closures as a result of the revolution in January 2011 could have affected financing of new and current construction projects. Likewise, the construction lag times would impact the project schedule (Participant 10, personal communication, July 10, 2020).

The participant added that, “Financing becomes an issue. Contractor must continue to pay the workforce and equipment cost otherwise risk losing these resources” (Participant 10, personal communication, July 10, 2020). The outcome to the project was “slow delivery and over budget projects” (Participant 10, personal communication, July 10, 2020). Participant 10 provided additional comments about risk management during the follow-up interview, “there was a combination approach. Risk mitigation was accomplished by using the contingency funds. Contract termination was avoided through communications with the stakeholders” (Participant 10, personal communication, August 19, 2020).

Participant 13 provided comments on the emergent theme on how the political economy impacts construction projects. The participant stated:

The Tunisian 2011 revolution resulted in the delayed important infrastructure construction projects as well as needed maintenance of existing infrastructure. Recently, the COVID-19 pandemic has shut supply chains down from Europe and America. Also, the labor force was laid off (Participant 13, personal communication, July 9, 2020).
The impacts of this negative risk event are provided as well. The participant added, “Political instability, supply chain, and workforce limitations have led to increased costs” (Participant 13, personal communication, July 9, 2020). Participant 13 stated:

The project site was shut down by governmental action which increased costs as well as negatively impact [sic] the project schedule. Through communication with the stakeholders it was determined that the project was no longer economically viable. The project was terminated due to the COVID-19 pandemic. The risk approach was acceptance (Participant 13, personal communication, July 9, 2020).

Participant 13 provided additional details during a follow-up interview, “Contract termination due to the COVID-19 pandemic was a reasonable conclusion to the construction project. The risk management approach was acceptance” (Participant 13, personal communication, August 18, 2020).

Participant 19 provided data on influence drivers related to the emergent theme of the political economy as an external environmental condition. Participant 19 stated, “Financial issues delayed the start of construction. Progress payments were consistently late from the stakeholders” (Participant 19, personal communication, July 13, 2020). The comment suggested that financial capital was not readily available resulting in delays to the construction project.

Participant 19 included additional information during the follow-up interview, “This risk was considered a shareholder issue. The risks were accepted which resulted in delays to the overall project deliverables” (Participant 19, personal communication, August 18, 2020). The Participant accepted the negative risk associated with the influence driver of delayed project financing.

Participant 26 provided data on influence drivers related to the emergent theme of the political economy as an external environmental condition. The participant stated, “The lack of
government funding can determine the survival of the project. When project funds are too limited, the number of workers you hire, the quality and equipment is limited. This negatively impacts the schedule” (Participant 26, personal communication, July 20, 2020). Participant 26 provided additional comments during a follow-up interview, “Limitations on project funds availability impacted the number of workers, equipment, and quality of the project. The impacts led to multiple construction project schedule delays. The project contract was awarded and the risk response was to accept the consequence” (Participant 26, personal communication, August 16, 2020). The risk management approach of acceptance led to construction project delays that impacted the schedule and delivery date.

Participant 28 provided an example of how influence drivers related to the emergent theme of the political economy that can impact construction projects. The participant stated, “Economic condition of Morocco and Algeria: Government policy makers and having these Governments as a major client’s [sic] effects construction project budgets (Participant 28, personal communication, July 11, 2020)”. Participant 28 provided additional comments during a follow-up interview, “Several attempts to communicate the impacts of the governmental policies were made. It was finally determined that these risks would be accepted and the governmental authorities would shoulder the cost impacts and associated project schedule delays” (Participant 28, personal communication, August 16, 2020). In this case, the construction project manager accepted the impacts due to government involvement.

Participant 30 provided data associated with the emergent theme of political economy as an external environmental condition by indicating that there were security issues on the construction project. The Participant stated, “Extra security for transport drivers, project site, management staff and project camps required an increase in external funds. The [sic] required
the company to take out loans to complete the project (Participant 30, personal communication, July 11, 2020). Additional, comments were provided, “Several construction projects have been delayed because of fragile security and the proliferation of armed groups in Libya. These have devastating consequences for its economy and neighboring countries” (Participant 30, personal communication, July 11, 2020). During a follow-up interview Participant 30 explained, “the security risk was mitigated by procuring extra security. The construction firm was required to finance the additional cost” (Participant 30, personal communication, August 19, 2020).

**Political economics and previous research.** Politics and economic factors are interwoven and create an interaction called political economics (Adeleke et al., 2018). Adeleke et al. (2018) suggested that political dynamics influence the external environment of construction projects. These political influences can take the form of security and community perception. Berman et al. (2017) expanded on this definition by offering that political influences on construction projects included the taxation system, civil unrest, war, terrorism, and religious turmoil. The economic dynamics influenced the external environment of construction projects through the accessibility of financing, interest rates, exchange rates, and inflation rates (Berman et al., 2017).

According to Adeleke et al. (2018), there was a direct relationship between political economics and construction risk management. Adeleke et al. (2018) explained that any nation with negative political dynamics would have a higher probability of negative risk occurrences in construction projects. Akanni et al. (2015) suggested that the impacts of political economics have long lasting effects that influence construction projects. The political economic influences how firms conducted business and the profitability of each venture (Berman et al., 2017).

**Political economics and conceptual framework.** Political economic dynamics influence the external environment of construction projects (Adeleke et al., 2018). The interaction between
construction projects and the political economic dynamics are risk conditions of the external environment. The Traditional Project Triangle is based on the successful management of the project scope, schedule, and budget (Larson & Gray, 2018). The DeLone and McLean (2003) model is based on the successful management of the project quality, functionality, and user satisfaction. The Time-dependent model is based on the successful management of the project efficacy, customer impact, business success, and preparation for the future (Shenhar et al., 2002). These constraints influence the entire project lifecycle from the initiation through the close-out to include the future preparedness of the firm.

Participants in the emergent theme category of political economy described negative impacts based on elements of the three project management concepts represented in the conceptual framework. These elements were project scope, schedule, budget, quality, satisfaction, and customer impact. Risk management was critical to ensure that political economics did not negatively impact these construction project outcomes. Akanni et al. (2015) supports this by suggesting that the political economic environment is an indicator of future outcomes of current and future construction projects within a defined region. Four influence drivers were revealed within the emergent theme of political economy. Participants described restrictive policies on travel, conflict associated with regional instability, currency fluctuations, and financing delays negatively impacted the construction project outcomes. Based on the collected data, the construction project manager would need to research available data on the ongoing and future political economic dynamics within the region. These actions would allow the construction project manager to adjust the project constraints based on data collected. Anticipating political economic events across these constraints would assist to manage risk and enhance the probability of construction projects success.
**Emergent Theme 4: Environment.** Construction projects are well-known for environmental challenges, which is a commonly cited source of an external environmental condition (Ballesteros-Pérez et al., 2018). The natural environment is defined as conditions that include weather, climate, climate change, and natural disasters (Alvanchi & JavadiAghdam 2019). The following paragraphs explore Participants 16, 17, 31, and 33 experiences of how the environment emerged as a theme.

Participant 16 provided data associated with the emergent theme of the environment as an external environmental condition. The participant provided insights related to the construction environment. The participant stated, “negatively impacted construction in Egypt includes weather impacts (e.g. hot, rain, and earthquakes)” (Participant 16, personal communication, July 14, 2020). The participant continued by explaining that many schedule delays mentioned have cost impacts. Participant 16 stated in a follow-up interview that, “risk caused by weather delays and associated costs were incorporated into the construction project schedule” (Participant 16, personal communication, August 18, 2020). The risk management technique offered by this participant was risk acceptance.

Participant 17 provided data associated with the emergent theme of the environment as an external environmental condition by offering details about working in high altitude areas of the Atlas Mountains in Algeria. The participant stated:

On January 8, 2018, 10 to 30 centimeters of snow accumulated in the northern Algerian town of Ain Séfra (Atlas Mountains). This resulted in the supply chain being cutoff for several days; delaying a power line project by 60 days (Participant 17, personal communication, July 8, 2020).
The participant further explained, “The construction project was time-based. When it was not delivered on schedule the project was considered a failure” (Participant 17, personal communication, July 8, 2020). The participant provided additional information during a follow-up interview, “We did not anticipate this risk and the site was shutdown to manage the negative impacts. There was not a risk response plan for this scenario and the risk was accepted” (Participant 17, personal communication, August 16, 2020). In this case, an occurrence of snow was unexpected and caused a supply chain to be broken. With no construction supplies being delivered to the project site schedule delays were incurred. The construction project manager did not anticipate this influence driver and the site was shutdown to manage the negative impacts.

Participant 31 offered comments associated with the environment as an emergent theme. The participant stated:

Water is a scarce resource in some regions of Egypt. Water needed to be trucked into the remote oil fields for concrete placement. This delayed the project ~180 days. The annual average rainfall is ~300-400mm depending on climatic as well as topography (Participant 31, personal communication, July 11, 2020).

The influence driver of water scarcity was a negative risk impact with this construction project. The scarcity of water caused an approximate 180 days schedule delay. The participant also provided, “Additional water being delivered required trucks, drivers, concrete, labor and fuel” (Participant 31, personal communication, July 11, 2020). During a follow-up interview, Participant 31 stated, “The risk was mitigated by securing resources. This impacted both the project schedule and budget” (Participant 31, personal communication, August 17, 2020).

Participant 33 commented that the construction was impacted by weather. The participant stated, that the walls of the structurally unsound and required demolition (Participant 33,
personal communication, July 11, 2020). This was due to “poor construction weather, the project needed to place concrete at night” (Participant 33, personal communication, July 11, 2020). Participant 33 included additional information during a follow-up interview, “Excessive winds or heat impacted the project schedule. We mitigated the risk by working at night” (Participant 33, personal communication, August 17, 2020). In this case, the construction project manager mitigated the risk by conducting work activities during nighttime.

**Environmental and previous research.** Environmental conditions are considered the external conditions of the surrounding construction project site or region (Project Management Institute, 2017). According to Alvanchi and JavadiAghdam (2019), the environmental conditions can include weather, climate, climate change, and natural disasters. The environment is an ever-changing influence that impacts construction projects. According to Ballesteros-Pérez et al. (2018), the environment can impact construction projects in multiple ways. These result in negatively impacting productivity and sometimes shutting down construction activities. It can ruin unprotected and exposed construction components such as mechanical and electrical systems. The environmental elements can negatively impact communications or block access to the construction location (Alvanchi & JavadiAghdam, 2019).

Environmental-related contract claims are a frequent source of disputes between construction project managers and clients (Ballesteros-Pérez, 2017). According to Ballesteros-Pérez (2017), the occurrence of unfavorable and unpredicted environmental conditions typically have two outcomes. The first outcome involved the suspension of construction activities until the adverse weather subsided. The suspension of construction activities resulted in extensions to the construction project schedule. The second outcome was the need to apply extra costly measures to counteract the influence of the weather and continue with construction activities work. The
continuation of construction activities work resulted in additional funds being allocated to the project budget. Any of these negative risks may lead to a dispute between the construction project manager and the client because of schedule delays or extra costs (Ballesteros-Pérez, 2017).

*Environment and conceptual framework.* The environment is an ever-changing influence that impacts construction projects. The interaction between construction projects and the natural environment are risk conditions of the external environment. Traditional Project Triangle established a measure of success based on whether a project is delivered with the defined scope, on time, and within budget (Pollack et al., 2018). DeLone and McLean (2003) established a measure of success based on how well the project deliverables met the intended requirement and satisfied the customer. The Time-dependent established a measure of success based project success on four levels: project efficiency, customer impact, business success, and preparation for the future (Shenhar et al., 2002). In all three concepts, external environmental conditions have the potential to negatively impact the outcome of a project. Managing risks is critical to ensure the natural environment does not negatively impact the construction project outcomes. Participants in the emergent theme of the environment category described negative impacts based on elements from the three project management concepts represented in the conceptual framework. These elements were project scope, schedule, satisfaction, and customer impact. Five influence drivers were revealed within the emergent theme of the environment. Participants describe the heat, rain, water scarcity, wind, and snow. Based on this data, the construction project manager would need to research available data on the ongoing and future environmental events within the region. These actions would allow the construction project manager to adjust the project constraints based on data collected. Anticipated natural events from
the environment assists with governing project constraints, to manage risk, and enhance
colorado project success.

**Relationship of Themes to Research Question.** Collected participant data illuminated
four emergent themes related to the research question. Research question one asked, “*What are the external environmental conditions that negatively impact construction projects in Northern Africa?*” Based on the emergent themes derived from participant surveys and follow-up interviews, the external environmental conditions that negatively impacted construction projects in Northern Africa are listed below. These external environmental conditions are listed in order of most to least frequent. The external environmental conditions that negatively impacted construction projects in Northern Africa were technology, legal bureaucracy, political economics, and environmental conditions. These particular emergent themes related to previous literature regarding external environmental conditions that increased the potential for construction project failure.

First, construction experience, knowledge, and training are required to implement
colorado projects successfully (Ntuli & Allopi, 2014). All construction projects have a
technical influence drivers. The lack of construction education appeared to be one of the major hurdles in Africa (Ntuli & Allopi, 2014). The interaction between construction projects and the technical influence drivers added layers of uncertainty as an external environmental condition. These technical influence drivers negatively impacted the construction project outcomes when risks were not managed effectively.

Complex construction project requirements, combined with a lack of technology,
enhances negative risk opportunities (Qazi et al., 2016). Qazi et al. (2016) suggested that the
effects of these negative risks led to poor project execution and resulted in schedule delays, costs
associated with rework, and low quality. The negative impacts led to customer satisfaction issues. The availability of technology needs to be considered to maintain successful project deliverables (Okoli et al., 2018). Okoli et al. (2018) established that the availability of skilled resources was a predictor construction project performance with complex requirements. Participants explained the lack of technology availability and the means to manage these negative risks. Effectively managing these negative risks enhanced the probability of construction project success. These actions would be considered critical when undertaking a construction project.

Second, legal bureaucracy is an external condition outside the construction project manager’s control but affects the construction project to varying degrees (Liu et al., 2019). The legal framework that governs construction is important for the operation of modern society. Kaminsky (2019) defined legal bureaucracy as an interrelationship between construction firms and legal processing systems operated by governmental officials. Instances of this legal framework included the construction permitting process, which serves to authorize and enforce basic societal safety standards such as structural integrity, sanitation, water, fire protection, and electrical services (Kaminsky, 2019). The definition used for legal processes in this context serves the community.

According to Treisman (2007), legal bureaucracy was defined as the use of public office or power for personal gain. African nations have more government corruption than more developed nations (Treisman, 2007). Ocheje (2017) posited that corruption in Africa was identified as the greatest risk in local government efforts to encourage construction development. Governmental corruption has a tendency to lead to the misallocation of financial resources resulting in negative risks for construction project efficiency (Araral et al., 2019). Corruption
also tended to prevent or reduce investment capital by foreign firms (Knutsen et al., 2017). This suggested that legal bureaucracy allowed for government corruption to be introduced into the legal framework that governs construction. Participants explained the contextual relationship of legal bureaucracy and the negative impacts on construction projects. Managing the potential negative risk across the project constraints would be considered critical. These actions could reduce the possibility of construction project failure due to legal bureaucracy.

Third, Adeleke et al. (2018) suggested that political economics influence the external environment of construction projects. Berman et al. (2017) expanded on this statement by offering examples of political economic influences such as taxation system, civil unrest, war, terrorism, religious turmoil, financing, interest rates, exchange rates, and inflation rates. Nations with negative political economic dynamics have a higher probability of negative risk occurrences in construction projects (Adeleke et al., 2018).

Akanni et al. (2015) suggested that the impacts of political economics have long-lasting effects that influence construction projects. Risk management was critical to ensure that political economics did not negatively impact the construction project outcomes. Participant data suggested that the construction project manager would need to research available data pertaining to the ongoing and future political economic dynamics within the region. These actions would allow the construction project manager to adjust the project constraints based on political economic data collected. Anticipating political economic events across project constraints would assist in managing negative risk and enhance the probability of construction project success.

Fourth, environmental conditions are considered the external conditions of the surrounding construction project site or region. According to Ballesteros-Pérez et al. (2018), the environment can impact construction projects in multiple ways. Alvanchi and JavadiAghdam
(2019) posited that environmental conditions can include weather, climate, climate change, and natural disasters. The influence drivers caused by environmental conditions materialize in the form of negative impacts to productivity and sometimes result in shutting down the construction project. It can ruin unprotected and exposed construction components such as mechanical and electrical systems. The environmental elements can negatively impact communications or block access to the construction location (Alvanchi & JavadiAghdam, 2019).

Participants provided detailed data on the environment and the influence drivers that negatively impact construction projects. The interaction between construction projects and the natural environment are risk conditions of the external environment. Managing risks was critical to ensure influence drivers associated with the natural environment do not negatively impact the construction project outcomes. Construction project managers would need to research available data pertaining to the ongoing and future environmental events within the region. These actions would allow the construction project manager to adjust the project constraints based on data collected. Anticipating natural events from the environment assists with governing project constraints to manage risk and enhance the probability of construction project success.

**Relationship of Emergent Themes to Research Sub-questions.** The relationship of emergent themes to the research sub-questions explored the impacts of negative risks and risk management approaches undertaken by the construction project manager to address the emergent themes from the data collected. Research sub-question one (SQ1) asked, *How do external environmental conditions negatively impact construction projects in Northern Africa?* This revealed the influence drivers that cause negative risk impacts. Sub-question two (SQ2) asked, “How do project managers manage negative external environmental conditions in the North
African region?” This revealed how negative risks were managed during the construction project.

**Research sub-question one (SQ1).** Based on the emergent themes derived from participant surveys and follow-up interviews, the external environmental conditions that negatively impact construction projects in Northern Africa are listed below. These external environmental conditions consisted of technology, legal bureaucracy, political economics, and environmental conditions that negatively impacted the construction projects compared to the conceptual framework. Projects are temporary, and a unique endeavor undertaken to develop and create a new product, service, or result with performance defined criteria (Project Management Institute, 2017). Achieving defined project goals within specific performance criteria are what drives project management (Davis, 2017). The participants stated that the four emergent themes caused some form of project failure.

Participants in the emergent theme of the technology category described negative impacts based on elements from the three project management concepts represented in the conceptual framework. These elements were project scope, schedule, budget, quality, satisfaction, functionality, and customer impact. Five influence drivers were revealed within the emergent theme of technology. Participants described the lack of trained labor, managerial inexperience, labor instability, shortages of material, and lack of transport as influence drivers associated with the emergent theme of technology.

Participants in the emergent theme of the legal bureaucracy category described negative impacts based on elements of the three concepts represented in the conceptual framework. These elements were project scope, schedule, budget, quality, functionality, satisfaction, preparation for
the future, and customer impact. Three influence drivers were revealed in the emergent theme of legal bureaucracy as corruption, permitting processes, and legal disputes.

Participants in the emergent theme category of the political economy described negative impacts based on elements of the three project management concepts represented in the conceptual framework. These elements were project scope, schedule, budget, quality, satisfaction, and customer impact. Four influence drivers were revealed within the emergent theme of political economy. Participants described restrictive policies on travel, conflict associated with regional instability, currency fluctuations, and financing delays negatively impacted the construction project outcomes.

Participants in the emergent theme of the environment category described negative impacts based on elements from the three project management concepts represented in the conceptual framework. These elements were project scope, schedule, satisfaction, and customer impact. Five influence drivers were revealed within the emergent theme of the environment. Participants describe the heat, rain, water scarcity, wind, and snow. These related to previous literature regarding external environmental conditions that increased the potential for construction project failure.

**Research sub-question two (SQ2).** Based on the emergent themes derived from participant surveys and follow-up interviews, the external environmental conditions and the subsequent negative risks were managed by the construction project managers using four risk management approaches. The risk management approaches implemented by participants are listed from most to least frequent. These approaches consisted of acceptance, mitigation, avoidance, and transference. The risk management approaches related to previous literature
regarding external environmental conditions and the influence drivers that increased the potential for construction project failure.

Risk acceptance involves accepting the consequences of the occurrence (Project Management Institute, 2017). Acceptance as a response to risk includes developing contingency or fallback plans. The contingency plan leads to diagnosing the risk, which assists with reducing the cost of the response. The fallback plan confronts the risk after it occurs. Typically, risk acceptance involves allocating additional human/financial resources or changing the scope/schedule of the construction project (Niekerk & Bekker, 2014). In the cases provided by the participants, negative risk acceptance was favored for the emergent themes of legal bureaucracy, political economy, and environment.

Risk mitigation responses are an effort to reduce the potential occurrence or consequences of an identified negative risk (Project Management Institute, 2017). Mitigation may involve reducing the potential impacts to an acceptable level. The appropriate response may include changing the construction project scope to minimize the potential impacts of the negative risk (Tanner et al., 2018). In the cases provided by the participants, negative risk mitigation was favored for the emergent themes of technology and environment.

A risk avoidance response is based on changing the project plan to eliminate the negative potential (Project Management Institute, 2017). The response can include eliminating unwanted consequences or protecting the construction project objectives from the negative risk effects. According to Vahlne et al. (2017), avoidance or removal of all negative risks is not feasible. In these scenarios, the negative risks should be dealt with as early as possible (Project Management Institute, 2017; Vahlne et al., 2017). In the cases provided by the participants, negative risk avoidance as a response was minimal for the emergent themes. One participant provided data on
risk avoidance associated with the emergent theme of legal bureaucracy with an emphasis on the influence driver of legal disputes.

Transferring risk means consequences of negative risk are placed upon a third party (Project Management Institute, 2017). The approach involves transferring negative risk management responsibility to another party without avoidance, mitigation, or acceptance. According to Lam and Siwingwa (2017), a common practice is to financially obligate insurance or bonding agencies that represent the construction contractor. The risk management approach is considered an effective approach in markets where price volatility can negatively impact future costs. In the cases provided by the participants, negative risk transference as a response was minimal for the emergent themes. One participant provided data on risk transference associated with the emergent theme of legal bureaucracy with an emphasis on the influence driver of corruption. The participant stated that activities associated with corruption were transferred as part of the project risk management approach on government projects.

Summary of the findings. The summary of findings presents the data collected to assist with addressing the research question. The conceptual framework provided three concepts that define project success. The concepts included the Traditional Project Triangle, DeLone and McLean, and Time-dependent models of project success criteria. Traditional Project Triangle established a measure of success based on whether a project was delivered with the defined scope, on time, and within budget (Pollack et al., 2018). DeLone and McLean (2003) established a measure of success based on how well the project deliverables met the intended requirement and satisfied the customer. The Time-dependent established a measure of project success on four levels: project efficiency, customer impact, business success, and preparation for the future.
(Shenhar et al., 2002). In all three concepts, external environmental conditions and associated influence drivers have the potential to negatively impact the outcome of a construction project.

These concepts of project success were used to develop survey and follow-up interview questions that were presented to the participants. Based on the data collected from the survey and follow-up interview questions, four emergent themes were developed that focused on the external environmental conditions. This revealed a total of seventeen influence drivers associated with the environmental condition that caused a negative risk impact. Participants provided data on the negative risk impacts to the construction project based on the three concepts from the conceptual framework. Participants also provided data on how these negative risk impacts were managed.

The four emergent themes that were developed from collected data that was associated with an external environmental condition were technology, legal bureaucracy, political economics, and environmental conditions. The emergent themes were structured from most to least frequent occurrence based on data provided by the participants. Technology was the first emergent theme from the survey and follow-up interview questions. Participants in the emergent theme of the technology category described negative impacts based on elements from the three project management concepts represented in the conceptual framework. These elements were project scope, schedule, budget, quality, satisfaction, functionality, and customer impact. Five influence drivers were revealed from participant data. These five influence drivers included a shortage of trained labor, managerial inexperience, labor instability, shortages of material, and lack of transport. These influence drivers negatively impacted the project lifecycle during the planning and executing phases of the construction project.
Legal bureaucracy was the second emergent theme from the survey and follow-up interview questions. Participants in the emergent theme of the legal bureaucracy category described negative impacts based on elements of the three concepts represented in the conceptual framework. These elements were project scope, schedule, budget, quality, functionality, satisfaction, preparation for the futures, and customer impact. Three influence drivers were revealed in the emergent theme of legal bureaucracy as corruption, permitting processes, and legal disputes. These influence drivers negatively impacted the entire project lifecycle from the initiation through the close-out.

Political economics was the third emergent theme from the survey and follow-up interview questions. Participants in the emergent theme of the political economics category described negative impacts based on the three project management concepts represented in the conceptual framework. These elements were project scope, schedule, budget, quality, satisfaction, and customer impact. Four influence drivers were revealed within the emergent theme of political economy. Participants described restrictive policies on travel, conflict associated with regional instability, currency fluctuations, and financing delays negatively impacted the construction project outcomes. These influences drivers negatively impacted the entire project lifecycle from the initiation through the close-out.

Environmental conditions was the fourth emergent theme from the survey and follow-up interview questions. Participants in the emergent theme of the environmental category described negative impacts based on elements of the three project management concepts represented in the conceptual framework. These elements were project scope, schedule, satisfaction, and customer impact. Five influence drivers were revealed within the emergent theme of the environment.
Participants describe the heat, rain, water scarcity, wind, and snow. These influences drivers negatively impacted the entire project lifecycle from the initiation through the close-out.

Based on the themes and negative risk impacts derived from participant surveys and follow-up interviews, the influence drivers were managed by the construction project managers using four risk management approaches. The risk management approaches implemented by participants are listed from most to least frequent. These approaches consisted of acceptance, mitigation, avoidance, and transference.

Risk acceptance involves accepting the consequences of the occurrence (Project Management Institute, 2017). Acceptance as a response to negative risk included developing contingency or fallback plans. The contingency plan led to diagnosis of risks, which assisted with the reduction of costs associated with the response. The fallback plan confronted the risk after it occurred. Negative risk acceptance was favored by participants for the emergent themes of legal bureaucracy, political economy, and environment and the associated influence drivers.

Risk mitigation responses attempt to reduce the potential occurrence or consequences of an identified risk (Project Management Institute, 2017). Mitigation involved a reduction of the potential negative risk impacts to an acceptable level. An appropriate response may include changing the construction project scope to minimize the potential impacts of the negative risk (Tanner et al., 2018). Negative risk mitigation was favored by participants for the emergent themes of technology and environment and the associated influence drivers.

Risk avoidance response is based on changing the project plan to eliminate the potential (Project Management Institute, 2017). Avoidance included eliminating unwanted consequences or protecting the construction project objectives from the negative risk impacts. Negative risk avoidance as a response was minimal for the emergent themes. One participant provided data on
risk avoidance associated with the emergent theme of legal bureaucracy with an emphasis on the influence driver of legal disputes.

Transferring risk means consequences of negative risk are placed upon a third party (Project Management Institute, 2017). Transferring involved transitioning negative risk management responsibility to another party without avoidance, mitigation, or acceptance. Negative risk transference as a response was minimal for the emergent themes. One participant provided data on risk transference associated with the emergent theme of legal bureaucracy with an emphasis on the influence driver of corruption. The participant stated that activities associated with corruption were transferred as part of the project risk management approach on government projects.

**Applications to Professional Practice**

Successful project implementation is essential in any industry to develop a competitive advantage. This study explored the relationship between external environmental conditions and construction project failures in countries of Northern Africa. The information gleaned from this study could be utilized in other sectors to avoid external environmental conditions that negatively impact the region. As a result, this could have multi-faceted effects when implementing projects throughout the region.

The study could assist construction firms and stakeholders to allocate resources, funds, and time more efficiently. Construction firms are primarily funded through government and non-governmental initiatives. Therefore, successful project implementation would indicate that the government or non-governmental entities were good stewards of taxpayer or stakeholder funds. Displaying fiscal responsibility could enhance competitive advantage for construction firms and the project managers implementing projects.
Additionally, successfully implementing construction projects means that the organizational strategy can advance forward. For example, if a mass transit construction project is successfully implemented, then the region gains more credibility from the stakeholders. More efficient transit operations could also contribute to a competitive advantage for the region. Therefore, governmental and non-governmental entities, as well as the construction firms gain credibility.

**Recommendations for Action**

The research results reflected that construction project managers struggled to complete projects within defined constraints. The researcher focused on the external environmental conditions and the influence drivers that negatively impacted construction projects. In future construction projects, project managers should explore better methods to manage the negative risks that originated from the external environment. According to Liu et al. (2019), risk management of construction projects is essential to successful completion.

Risks are part of every construction project, and there is a need for enhanced risk management processes (Cagliano et al., 2015). The research suggested that negative risks from the external environmental conditions and influence drivers were dynamic throughout the construction project lifecycle. These influence drivers could trigger negative risks that jeopardized the realization of the construction project objectives and must be managed effectively. Project managers play a significant role in examining every phase in the lifecycle for risk. The better a project manager identifies, plans for, and reacts to negative risks directly impacts the construction project lifecycle. The collected data and research results can be sent to the participants via email to assist with developing an awareness of potential negative risk.
impacts that originate from external environmental conditions. The results could assist in improving construction project implementation within the region of Northern Africa.

**Recommendations for Further Study**

A few recommendations were identified during the course of this study. These recommendations could enhance the study and improve the data quality. The following paragraphs expand on these recommendations for further study.

The population size could be expanded. This study explored 5 countries in Northern Africa. The study could be expanded to explore Eastern, Western, and Southern regions of the continent. Likewise, other continents, regions, or countries could be explored using this study as a template.

Specific construction projects could be targeted for the study. This study explored construction projects as a whole. Targeted examples include horizontal or vertical construction projects. For instance, targeted construction projects could include infrastructure, commercial, or residential developments. Exploring targeted types of construction projects may reveal different outcomes and recommendations for action.

Mixed research methods could be utilized. This qualitative research study explored the construction project manager’s perceptions. Using mixed research methods to add quantitative data on construction project failures may provide additional insight to the problem.

**Reflections**

The dissertation process was challenging and rewarding. The researcher has worked in the project management field for over 15 years. The research topic was selected based on interest of the area and subject matter. Many projects in construction fail to meet the project constraints. Having the chance to research this specific problem provided the researcher an opportunity to
gain knowledge on the topic of external environmental conditions. Likewise, the survey and follow-up interview processes allowed for a deeper understanding of the problem. Research bias was a concern based on personal experience of working in the construction project management field for several years. That stated, the concern of bias was determined to be unfounded. The participants provided in-depth data and the survey and follow-up interview answers were candid.

The preconceived ideas and biases of the researcher regarding the topic and research problem were mitigated by conducting surveys with follow-up interviews. Follow-up interviews were requested based on risk management approaches. This served the purpose of adding depth and breadth to participant responses. The researcher does not believe any preconceived ideas and biases influenced data collected by participants. The researcher has developed new insights as a result of this research. The researcher has developed a deeper understanding of this problem and will continue to research areas of construction project management. There is extensive literature on project management, but in the field of construction project management in the African region research was limited. The researcher is motivated to continue working and researching construction project management in other regions.

**Summary and Study Conclusions**

External environmental conditions are a group of factors that are outside of the construction project manager’s immediate control. The external environmental conditions represents a complex set of interdependent influence drivers that continuously interact with the construction project. These influence drivers have the potential to negatively impact construction project success. Construction project managers are responsible for identifying, examining, and developing risk management approaches to confront the influence drivers that could cause
negative risks. Risk management is critical to ensure negative risks do not directly impact construction project deliverables and success.

The purpose of this qualitative case study was to explore and describe the impacts between external environmental conditions and construction project failures in countries of Northern Africa. The specific problem was explored through an in-depth study of external environmental conditions and the influence drivers. The effects on construction projects from these external environmental conditions assisted in establishing contextual descriptions. These contextual descriptions revealed the drivers behind the external environmental conditions that influence construction project outcomes in Northern Africa. The information gleaned from this study enhances the understanding of the negative risks in Northern Africa and construction projects, which expands the body of knowledge of project management.

The research question that guided this study was, *What are the external environmental conditions that negatively impact construction projects in Northern Africa?* Two sub-questions were developed to support the primary research question. Research sub-question one (SQ1) asked, *How do external environmental conditions negatively impact construction projects in Northern Africa?* Sub-question two (SQ2) asked, *How do project managers manage negative external environmental conditions in the North African region?*

The conceptual framework consisted of three concepts that define project success. The concepts included the Traditional Project Triangle, DeLone and McLean, and Time-dependent models of project success criteria. Traditional Project Triangle established a measure of success based on whether a project was delivered with the defined scope, on time, and within budget (Pollack et al., 2018). DeLone and McLean (2003) established a measure of success based on how well the project deliverables met the intended requirement and satisfied the customer. The
Time-dependent established a measure of project success on four levels: project efficiency, customer impact, business success, and preparation for the future (Shenhar et al., 2002).

The three concepts of project success were used to develop the survey and follow-up interview questions that were presented to the participants. Based on the data collected from the survey and follow-up interview questions, four emergent themes were developed that focused on the external environmental conditions. The participant revealed a total of seventeen influence drivers associated with each environmental condition that caused a negative risk impact. Participants provided data on the negative risk impacts on the construction project based on the three concepts from the conceptual framework. Participants also provided data on how negative risk impacts were managed.

The four emergent themes developed from collected data associated with external environmental conditions were technology, legal bureaucracy, political economics, and environmental conditions. The emergent themes are structured from most to least frequent occurrence based on data provided by the participants. Technology was the first emergent theme from the survey and follow-up interview questions. Participants in the emergent theme of the technology category described negative impacts based on elements from the three project management concepts represented in the conceptual framework. These elements were project scope, schedule, budget, quality, satisfaction, functionality, and customer impact. Five influence drivers were revealed from participant data. These five influence drivers included a shortage of trained labor, managerial inexperience, labor instability, shortages of material, and lack of transport. These influence drivers negatively impacted the construction project lifecycle during the initiation through the close-out phases to include the future preparedness of the firm.
Legal bureaucracy was the second emergent theme from the survey and follow-up interview questions. Participants in the emergent theme of the legal bureaucracy category described negative impacts based on elements the three concepts represented in the conceptual framework. These elements were project scope, schedule, budget, quality, functionality, satisfaction, preparation for the futures, and customer impact. Three influence drivers were revealed in the emergent theme of legal bureaucracy as corruption, permitting processes, and legal disputes. These influence drivers negatively impacted the construction project lifecycle during the initiation through the close-out phases to include the future preparedness of the firm.

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describe the heat, rain, water scarcity, wind, and snow. These influences drivers negatively impacted the entire project lifecycle from the initiation through the close-out.

Based on the themes and negative risk impacts derived from participant surveys and follow-up interviews, the influence drivers were managed by the construction project managers using four risk management approaches. The risk management approaches implemented by participants are listed from most to least frequent. These approaches consisted of acceptance, mitigation, avoidance, and transference.

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Conclusions suggested that influence drivers from the external environmental conditions were dynamic throughout the construction project lifecycle. The influence drivers that triggered negative risks jeopardized the realization of the construction project objectives and must be managed effectively. Project managers play a significant role in examining every phase in the project lifecycle for influence drivers that could cause negative risks. The better a project manager identifies, plans for, and reacts to negative risks directly impacted construction project outcomes.
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Appendix A: Survey and Interview Questions

Consent and Instructions

Title of the Project: Examination of the relationship between external environmental conditions and construction project failures in countries of Northern Africa.
Principal Investigator: Rex Mols, Liberty University student and Project Manager

You are invited to participate in a research study. In order to participate, you must be 18 and a construction project manager. Taking part in this research project is voluntary.

Please take time to read this entire form and ask questions before deciding whether to take part in this research project.

The purpose of the study is to explore the relationship between external environmental conditions and construction project failures in countries of Northern Africa. The study attempts to lessen the potential of construction project failures by identifying common external environmental conditions that negatively impact construction projects.

If you agree to be in this study, I would ask you to do the following things:
1. Click the hyperlink to the survey.
2. Complete the anonymous, online, 5- to 10-minute survey.

Benefits to society include increasing the potential success factors on future construction projects in this region.

The risks involved in this study are minimal, which means they are equal to the risks you would encounter in everyday life.

The records of this study will be kept private. Research records will be stored securely, and only the researcher will have access to the records.
• Participant responses will be anonymous.
• Data will be stored on a password-locked computer and may be used in future presentations. After three years, all electronic records will be deleted.

Participants will not be compensated for participating in this study.

Participation in this study is voluntary. Your decision whether to participate will not affect your current or future relations with Liberty University. If you decide to participate, you are free to not answer any question or withdraw at any time prior to submitting the survey.

If you choose to withdraw from the study, please exit the survey and close your internet browser.

The researcher conducting this study is Rex Mols. You may ask any questions you have
now. If you have questions later, you are encouraged to contact him at Research_Student2020@outlook.com. You may also contact the researcher’s faculty sponsor, Christopher McChesney, at csmcchesney@liberty.edu.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, you are encouraged to contact the Institutional Review Board, 1971 University Blvd., Green Hall Ste. 2845, Lynchburg, VA 24515 or email at irb@liberty.edu
Initial Survey Questions

1. Why did the construction project fail to be delivered on schedule?

2. Why was the construction project not completed within budget?

3. Why did the construction project fail to meet the functionality of the requirements?

4. Why was the customer not satisfied with the final deliverable?

5. Why did the construction project fail to achieve the organizational strategy?

6. What was the overall value of the project?
Follow-up Interview Question

1. How were the negative risks the external environmental condition described in the previous survey managed?

For example:

Avoidance — eliminate the risk

Transfer — move the risk elsewhere (to a supplier, to an insurer/surety bond)

Mitigation — develop an approach plan to reduce the consequence and/or the potential of a risk event occurring

Acceptance — accept the risk and the consequence and/or outcome

Please explain your answer:

2. Would you like to provide additional information on the survey questions pertaining to external environmental conditions?