THE IMPACT OF AGILE PROJECT MANAGEMENT ON PRODUCTIVITY
IN IT PROJECTS

by

Kristin A. Seeton

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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

May 2022
Abstract

Agile project management is considered an enabler for increased productivity over traditional project management frameworks because Agile helps the team remain focused and transparent, fostering collaboration, communication, and accountability. The methodology relies on self-organized and frequently geographically disbursed teams. This approach encourages creativity and innovation, increases the pace of development, enables flexibility in response to changing requirements, and promotes customer satisfaction. However, implementing Agile methodologies requires a philosophical change in management’s approach. Adapting to an Agile organization requires understanding the differences in methods and the impact of the changes on the working culture. The engagement of remote team members by the scrum master is critical to the project's success. Therefore, this qualitative case study explores the interaction between distributed team members and the Scrum Master. The primary data source was interviews with remote Agile team members and Scrum Masters from a manufacturing company in North America. The results indicated that transformational leadership and extensive agile knowledge and proficiency significantly impacted the productivity and efficiency of the project team.

Keywords: Agile project management, engagement, Scrum Master, distributed team, leadership style, training
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Approvals

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Date

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Date

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Date
Dedication

I dedicate this work to my son, Kristofer Seeton, the light of my life and my biggest cheerleader. Kristofer, I thank you for all the nights and weekends I had to work, and you graciously stayed with Aunt Mel or Grandma and Grandpa, played with your Nintendo Switch, or slept in the chair next to me. I hope my hard work and perseverance inspire you to follow your dreams. I look forward to supporting you in your future endeavors and will be with you every step of the way. I love you. This work is also dedicated to my great-grandmother, Hilda Huthmacher. While you are no longer with us, I know you are watching over all of us. You always pushed me to do better and work harder. I wish you were here to share this with me. At my high school graduation, the Bible you gave me is always near me on my desk and has been invaluable on this journey. “Fathers, do not provoke your children to anger but bring them up in the discipline and instruction of the Lord” (English Standard Version, 2001/2016, Eph. 6:4). There were so my times during my studies that I would have loved to discuss the Biblical integrations with you. You were my spiritual guide. I miss you.
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I want to thank Dr. Godson Mensah for his support, feedback, and guidance throughout this process. I couldn’t have asked for a better chair. My entire dissertation committee provided terrific support, criticism, and advice for improving my work and helping me realize this goal. I would also like to thank my parents, Diane and Ed Seeton, and my sister, Melanie Ledger. Their support and encouragement kept me on track and making progress. Without the help of my beautiful friends Katie, Neringa, and Shannon, my son would be addicted to video games! Thank you all for taking Kristofer under your wings and giving me time to complete my research. Lastly, going to school online can be pretty lonely, but I met a dear friend early on. Lynnette, thank you for the emails, encouragement, texts, and all the phone calls. I couldn’t have done it without you, my friend.
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Section 1: Foundation of the Study

The Agile Manifesto was created roughly 20 years ago (Dingsøyr et al., 2012). Since that time, Agile Scrum methodologies have gained a significant stronghold as developmental approaches, specifically in the information technology sector (Srivastava & Jain, 2017). While Agile tools and techniques have witnessed exponential growth during this period, work remains to be completed to understand further and incorporate remotely located team members. Alzoubi et al. (2016) proposed communication is the bond between project participants that promotes knowledge sharing, camaraderie, and cooperation, thereby providing a stable foundation for the flexibility and speed of Agile work. Communication and collaboration are the cornerstones of successful Agile projects (Holzmann & Panizel, 2013; Yagüe et al., 2016). However, there are several reasons Agile projects do not thrive, including budget issues, unclear goals or requirements, paramount to this study, disastrous communication, and collaboration within distributed teams (Dreesen et al., 2016; Qureshi et al., 2018). Considering the facts mentioned above, this study explores why Scrum Masters fail to engage distributed team members and how this impacts team productivity. Specifically, communication and collaboration methods and leadership and management styles were examined concerning Scrum Master team engagement.

The first section of this document represents the groundwork for the research to be conducted. By identifying a gap in the literature, the background of the problem was provided, followed by the problem statement. Next, the purpose statement describes the objective and motivation for the study. Furthermore, the study's reasons were indicated, followed by a justification for the study type and the selected research method and design. The research questions were clarified and presented. A theoretical and conceptual framework was suggested to explain and visualize the interdependent theories and concepts that influence and impact the
study. A brief overview of the study's assumptions, limitations, and delimitations were discussed following the framework discussion. A short biblical integration was carried out to aid critical and Christian-centric thinking to strengthen understanding of God's purpose and plans and how his children can carry out his work. This section concludes with an exhaustive professional and academic literature review of related research and topics.

Background of the Problem

As project management methodologies and techniques gain popularity, the need to address the rigidity and unresponsiveness of traditional project management methods led to the increased adaptation of Agile project management (Lei et al., 2017). The flexibility inherent in Agile methods allows for adaptability to requirement changes, supporting the need for consistent project advancement. The current literature extols the advantages of an Agile approach due to its emphasis on teamwork via co-creation and collaboration among self-organized and cross-functional teams (Hidalgo, 2019). The benefits of Agile project management have been hyped by both business and academia. Nevertheless, difficulties persist due to organizational culture, reluctance to change, and the required management support (Campanelli & Parreiras, 2015). Leading Agile methods were not designed to accommodate globally distributed teams (Dreesen et al., 2016; Vallon et al., 2018).

Campanelli and Parreiras (2015) suggest an Agile approach lacks practical tailoring to meet organizational and cultural conditions. Agile project methods depend on substantial interaction and feedback between team members and customers. Srivastava and Jain (2017) observed that an Agile Scrum methodology aids communication with stakeholders, enabling a broad exchange of ideas and eliciting verbal and non-verbal communication cues. However, the researchers also claimed that globally distributed team members frequently miss the nuances of
these interactions and do not wholly comprehend requirements or issues. Consequently, Scrum activities such as the daily stand-up meeting become challenging to manage with distributed teams resulting in loss of morale and decreased productivity (Srivastava & Jain, 2017).

Srivastava and Jain (2017) indicated that among Fortune 500 companies, Scrum is the preferred Agile method; however, most teams have one central Scrum Master regardless of the team member's physical location. Due to the reoccurring nature of the daily stand-up meeting, each member is expected to take on Scrum Master responsibilities as needed (Srivastava & Jain, 2017). Agile Scrum meetings require a specific focus on coordinating and communicating with team members, which may be challenging for some members (Moe et al., 2018). While the stand-up meeting can support the exchange of information, decision making, coordination, planning, and monitoring, without proper training and Agile understanding, the daily stand-up meeting is often deemed lengthy, too frequent, and veiled as a tool for management reporting (Stray et al., 2018).

For this study, the leadership qualities and competencies of Scrum Masters were evaluated to determine which factors impact productivity and team effectiveness. The study's findings can aid organizations in assessing Scrum Master skills, communication methods, and collaboration tools. Improved comprehension of the talents and capabilities needed to increase awareness and coordination among distributed team members will help project management address the leadership requirements necessary for Scrum Masters, improving the overall team communication and understanding, thereby increasing productivity.

Problem Statement

The general problem addressed was the failure of Agile Scrum Masters to engage globally distributed team members in Agile meetings resulting in reduced productivity. In a
recent study, Stray et al. (2018) found that daily meetings are difficult to organize to benefit all team members, leading to feelings of disengagement and disconnection (Bano et al., 2016). Likewise, remote team members’ perception of meeting value is significantly impacted by the Scrum Master's facilitation abilities (Stray et al., 2018). Research has shown that team communication and effectiveness decrease as the physical distance between team members increases (Ambos et al., 2016). Compounding the issue is a limited understanding of the detrimental effects of Agile teams concerning remote team engagement and productivity (Parker et al., 2015; Qureshi et al., 2018). The specific problem addressed in this study was the failure of Agile Scrum Masters within information technology (IT) projects based in the United States to engage the globally distributed team members in meetings resulting in lost productivity.

**Purpose Statement**

The purpose of this qualitative case study was to expand and develop the project management body of knowledge by delving deeper into the understanding of how the inability of the Agile Scrum Master to interact with and lead globally distributed team members impacts productivity. In addition to adequately managing cost and time constraints within adaptive process projects such as Agile (Project Management Institute, 2017b), presenting insight to relevant Scrum Master characteristics and skills will add value for the customer and product owners. Program management and product owners can use this information to evaluate the Scrum Masters. Scrum Masters can use the acquired knowledge to hone their servant leadership skills further and facilitate team participation and collaboration. This problem is explored through an in-depth case study of Scrum Master engagement with distributed team members and the impact on productivity in information technology projects undertaken by a global manufacturer.
Research Questions

Adaption of Agile project management methods has increased by over 50% since 2013 (Özkan & Mishra, 2019). The project management approach's popularity benefits from its fundamental speed, efficiency, flexibility in handling changeable requirements, and extensive collaboration among team members (Özkan & Mishra, 2019). However, there is little empirical evidence to support the belief that Agile project management methodologies increase the probability of IT project success (Serrador & Pinto, 2015; Usman et al., 2016). In Agile projects, the Scrum Master has the authority to facilitate team communication and meetings, eliminate obstacles and impediments, and enable the team to move forward rapidly with development (Usman et al., 2016). In a study on Agile performance by Serrador and Pinto (2015), results indicated improved project delivery metrics, yet no evidence showed improvements in other performance indicators. In the extant literature, there is limited consideration of the benefits and disadvantages of Agile teams on productivity and the appropriate leadership method (Parker et al., 2015; Zada et al., 2015). This case study gathered perceptions, viewpoints, and interactions used to increase understanding of the Scrum Master's communication with distributed team members by interviewing project members to address the research questions.

The research questions for this study are:

RQ1. Why do Scrum Masters fail to engage regional team members in daily stand-up meetings and sprint planning meetings?

RQ2. What are regional team members' perceptions of the Scrum Master's engagement during the daily stand-up and sprint planning meetings?

RQ2a. What Scrum Master behaviors and actions are perceived as helpful?

RQ2b. What Scrum Master behaviors and actions are perceived as unsupportive?
RQ3. In what ways does the Scrum Master describe experiences, interactions, and expectations of the remote team members?

Nature of the Study

Discussion of Method

The study was well suited for a qualitative design. A qualitative approach provides an avenue for study participants to discuss the problem and promote an acceptable solution. Giving participants a voice in the problem resolution is integral to a qualitative study method. Qualitative analysis is appropriate for investigating and surmising the problem through the study participants' thoughts, actions, and statements (Creswell, 2014). Qualitative research is the dominant technique applied when employing an interpretive paradigm (Creswell & Poth, 2018).

On the other hand, Creswell (2014) indicated that in quantitative research, hypotheses are tested by analyzing and comparing relationships between variables. Data gathering for the current study focuses on self-reporting by study participants lending to potential reporting bias by remote team members, which fails to meet the quantitative analysis requirement of valid numerical data. The research questions seek to elicit the personal perception of skills and characteristics that lead to rich engagement of distributed team members by the Scrum Master; consequently, a quantitative approach is not an appropriate research method for this study. Although a quantitative approach with a descriptive design was evaluated, a comparison between multiple research designs indicates qualitative research is suitable for addressing the stated problem. Stake (2010) suggested that being investigative by nature, a qualitative research method strives to educe the observations and experiences of study participants. Stake also indicated the outcome of a qualitative research method relies on the narratives made by study subjects within the framework of discovery and interpreted by the researcher.
Lastly, a mixed-method design was assessed. This type of research method uses both quantitative and qualitative analysis, which can be useful in evaluating the data. However, as Creswell (2015) noted, a mixed-method approach must have explicit integration between each distinct research approach. While mixed method research can be an effective tool, I was considering the goal of this study, exploring and understanding the engagement characteristics and skills of the Scrum Master with remotely placed team members, the underlying elements of the study framework point to a reliable quantitative approach. Basias and Pollalis (2018) discussed that qualitative approaches further comprehensive analysis, aiding in grasping the nature and complexity of the problem. Therefore, a qualitative method was selected for the proposed study as the researcher will interpret the findings based on the interaction between the researcher and study participants.

**Discussion of Design**

Creswell and Poth (2018) asserted that a case study approach originates with the identification of a specific experience to be reviewed and investigated. The case must be bounded with a specific period, location, and group (Yin, 2018). Accordingly, the proposed case is intrinsic to exploring the unique situation (Creswell & Poth, 2018) of remote team productivity based on engagement with the Scrum Master. For this study, the researcher accumulated data from varied sources, including interviews and documents that offer a comprehensive exploration of the subject. The proposed study is based on a single case within a global organization. A case study design was chosen to obtain in-depth exploration and understanding to foster the knowledge and analysis of Agile team perceptions and interactions with the Scrum Master. A case study enables the researcher to delve into individuals’ thoughts and attitudes regarding the specific problem (Creswell, 2015).
Several other qualitative design methods were evaluated prior to selecting the case study. Phenomenology design, based on a one-time occurrence or event, was not selected. Creswell (2015) stated that phenomenology design focuses on a single incident experienced by a group or multiple individuals. Therefore, it did not appear to be a good fit with the Scrum Masters’ differing levels of expertise and experience. Likewise, a narrative approach was ruled out as it relates to life experiences instead of the evaluation of an individual's characteristics. A narrative approach was not appropriate, as the research topic includes several team members, product owners, and Scrum Masters and does not solely focus on singular life experiences. In the search for the appropriate qualitative design, ethnography was explored. An ethnographic design typically focuses on a cultural event occurring in a natural setting over an extended time (Creswell, 2014). This type of design does not match the purpose of the study and, therefore, was not chosen. Lastly, grounded theory was evaluated for the study design. However, because grounded theory relates to developing a new approach based on data patterns and relationships gathered from field observations of events regarding significant social impacts, it was not considered a good fit for this study (Creswell, 2014). Recognizing the goal of this study was to determine existing characteristics and skills that lead to successful engagement between Scrum Masters and remote team members, a case study best matches the selection criteria.

Theoretical/Conceptual Framework

Management Theory

For this study, several management theories were evaluated. Supported by project initiatives, organizational strategy directly leads to a discussion of complexity regarding business and management. Frequently, organizations are characterized as complex systems. Geraldí et al. (2011) specifically discussed how organizations understand and respond to complexity in project
environments and how the project manager's experiences differ in response to the level of project
difficulty. Project-based companies commonly attempt to foster standardized processes to
combat complexity (Geraldi et al., 2011). The bodies of knowledge offered by various
professional project management associations combined with management theory attempt to
provide best practices and process standardization. However, as the study results indicate,
standardization is best addressed by individual teams and projects.

Effective change management is directly reflected in an organization's ability to control the activities and functions within its environment (Kotter, 2014). Kotter (2014) explained that due to the rapid level of change, complexity, and disruption of business environments, best practices are not solely enough to accommodate the extraordinary frequency of change. Management theory suggests that organizations with competent managers respond quicker and more deftly, thereby thriving under intense pressure to change. Comparing start-ups to mature organizations indicates that hierarchical bureaucracy overtakes adaptable networking (Kotter, 2014). As the organization grows, the hierarchical aspects control resources, restricting agility, efficiency, and opportunity pursuing network. Furthermore, Kotter (2014) determined that successful organizations must create a fundamental managerial structure with supporting processes and infrastructure yet recognize and adhere to the entrepreneurial spirit evident in the early years. Blending network management and transformational leadership theories creates the foundation upon which innovative initiatives, flexible work teams, associate empowerment, and creativity are strengthened and prepared to support Agile project methodologies.

The Theory of Constraints (TOC), introduced by Goldratt in 1984, concentrates on system improvement where a sequence of independent processes characterize a system. One of the central tenants of TOC is focusing on prioritized problems, those that are critical regarding
the entire system (Trojanowska & Dostatni, 2017). The theory relates to identifying issues that limit the performance of the system and reducing those constraints to make the system more efficient (Izmailov et al., 2016). TOC is highly relevant to project management, particularly Agile and Scrum Project Management methodologies, whereby roadblocks and issues are continually monitored and managed by the Scrum Master. The Scrum Master is tasked with eliminating behavioral or cultural issues or problematic team dynamics detrimental to project objectives removing the constraints that prevent active and collaborative engagement.

**Leadership Theory**

In Agile Project management, the Scrum Master is responsible for leading the team and helping remove obstacles and barriers to meet the objectives outlined by the customer requirements; therefore, a review of leadership theory is presented. Leadership skills are essential for motivating team members and organizing resources to ensure the achievement of an organization's goals. Effectual leadership encourages innovation, adaptation, and performance initiatives. Studies show that leadership is paramount for organizations and teams (Crossan & Apaydin, 2009; Yukl, 2008). Leadership theorists typically designate three distinct types of leadership, transactional, transformational, and laissez-faire (Antonakis & House, 2014; Bass, 1985).

Transformational leadership is seen as a higher level of engagement where leaders and team members work together, cultivating an atmosphere of mutual encouragement that leads to more motivated actions and results (Antonakis & House, 2014). Bass (1988) furthered this dialogue by depicting transformational leaders as inspiring, charismatic, and galvanizing. As with transformational leadership, Scrum Masters must balance influence, inspiration, motivation, and stimulation in appropriate individualized levels for team members (Srivastava & Jain, 2017).
Certain aspects of transactional leadership are required to provide the necessary associate supervision, support, and training to meet corporate objectives. However, team members led with a transformational leadership style acknowledged feelings of encouragement and commitment to exceed goals (Bass, 1988). Scrum Masters must exhibit flexibility in applying leadership capabilities when guiding their team.

The ability to adapt leadership style to evolving situations is commonly referred to as Situational Leadership. This leadership style was explored considering Scrum Master's comprehension and adaptability when confronted with team member needs and disruptive change throughout the project's sprints. Hersey and Blanchard developed situational Leadership after analyzing required leadership involvement based on the team's work maturity and experiences (Tortorella & Fogliatto, 2017). Leadership style is balanced to meet the team's needs (as cited in Thompson & Glasø, 2015, p. 527). Influential Scrum Masters must develop the capability to rapidly adjust and select the appropriate leadership style based on the current situation. Likewise, along the project life cycle, the balance between task orientation and relationship is highly dependent on the team's maturity. Application of leadership and management theories must be evaluated and adopted by the Scrum Master based on the situation and tasks needed to realize the project outcome. This study explored the balance between leadership and management styles and team productivity.

**Agile Project Management Theories**

Control theory can be used to identify project conditions that are ripe for Agile methodologies. Customer requirements continuously change throughout the project life cycle due to evolving business needs. Maruping et al. (2009) discussed a team's inability to address changing requirements as a significant cause of project failure due to cost overruns, poor quality,
or missed deadlines. The research found in IT project literature showcases the importance of project management methodologies in successful projects (Barki & Hartwick, 2001; Chan & Thong, 2009). Formal control methods are commonly centered on performance evaluations focusing on output and aligning associate behavior to the organization's goals.

On the other hand, informal control methods are highlighted by social strategy relying on community dynamics and self-regulation to narrow the gap between associate and organizational objectives (Maruping et al., 2009). Informal control can be broken down into self-control and clan control. Self-control encourages team members to set individual goals and self-monitor by identifying necessary activities and executing the appropriate tasks to complete those activities (Maruping et al., 2009). The authors also stated that socializing teams foster clan control to the same norms and values as those championed by the organization via shared experiences, rituals, and storytelling. Although Agile teams display many characteristics of self-managed teams, the high level of uncertainty and change demand flexibility. Scrum Masters are tasked with balancing the flexibility and structure necessary to meet customer requirements amidst constant change.

The goal of understanding stakeholder objectives, requirements, and expectations during a project is referred to as stakeholder theory (Schaltegger et al., 2017). Stakeholders are those individuals, internal or external to the organization, directly impacted by the project's delivery and outcome. A Scrum Master's core task is to promote inclusion across all stakeholder levels, cognize stakeholder requirements, and deliver them throughout the life of a project (Maak & Pless, 2006). Depending on the stakeholder, the Scrum Master must integrate cultures, interests, needs, and values while facilitating continuous dialogue between them to mobilize and align all efforts to realize the common goals of the project (Maak & Pless, 2006). The authors further
discussed that leaders ascend from good to great by demonstrating the intellectual aptitude to perceive, manage, and evaluate complex problems and circumstances from diverse positions concerning varied and occasionally conflicting goals. This study furthered that discussion by exploring Scrum Master experiences, years of agile involvement, and training background.

**Discussion of Theoretical Framework**

Multiple theories were proposed that provide an understanding of the influencing concepts that help define project management application within an organization. These theories build a composite picture of the skills and characteristics of successful and engaging leaders and are directly relatable to the necessary attributes of effective Scrum Masters. Several sub-theories, such as control and stakeholder theory and the theory of constraints, address aspects of the Scrum Master's responsibility to remove barriers for the team and manage stakeholder expectations and perceptions. An organization's project management philosophy is built upon elements of all these theories. Because the project portfolio achieves organizational strategy, knowledge of leadership, management, and project management theories apply to the organization, and the Scrum Masters employed to carry out strategic projects. The impact of Scrum Master leadership and management style is evaluated in this study to determine the effect on remote team engagement and team productivity.
Significance of the Study

Project management has become a mainstay of organizational management and is commonly practiced across the globe, irrespective of industry or location. However, the intense impact of market competition requires a quick response to customer demands, processes, and organizational adjustments to remain competitive and increase market share and profit (Azanha et al., 2017). Agile project methodologies are gaining prominence due to the flexibility and increased speed and quality purported by supporters. However, Agile methods, precisely a Scrum approach, can be complicated and detailed to implement. Many reasons corroborate the difficulties in adapting Agile project methodologies. As indicated by existing literature, one such idea suggested a lack of understanding Scrum Master leadership styles that adequately engage remote team members to ensure productivity gains pertaining to the completion of user stories.
(Barke & Prechelt, 2019; Srivastava & Jain, 2017). The goal of this study was to explore how Scrum Masters are failing to engage remote team members and the residual impact on productivity in IT projects.

**Reduction of Gaps**

Moe et al. (2012) discussed the ability of Agile Scrum methodology to encourage change in how teams communicate and collaborate not only among team members but with the Scrum Master as well. The Scrum Master conducts daily Scrum meets to ensure each team member understands the requirements, timelines, and deliverables selected for the sprint. The meeting is held daily to serve as a communication and collaboration tool for identifying barriers or impediments to forward progress (Moe et al., 2012). However, as specific expertise is spread globally, remote location teams are becoming the norm. Research shows the lack of co-located teams reduces communication frequency and effectiveness (Ambos et al., 2016). Through a lens of transformational leadership and network management theory, this study seeks to reduce gaps in understanding how and why Scrum Masters fail to engage remote team members and the impact this failure has on the team's productivity. Reducing the knowledge gap will aid Scrum Master selection and provide insight into team member perceptions and experiences in dealing with Scrum Masters.

**Implications for Biblical Integration**

Project management is an essential aspect of management in implementing organizational strategy. The achievement of strategic goals is advanced by detailing the deliverables of a project and ensuring value is delivered compared to the business opportunity presented (Gamble et al., 2019). In Agile project management, the Scrum Master plays a critical role in the success of each sprint and the overall project. The Scrum Master ensures that team members observe Agile tenets
and philosophies and adhere to the organization and team's processes and practices. Prior to project commencement, planning and preparation help manage risk, quality, integration, and collaboration, thereby reducing the naturally chaotic atmosphere of a project.

There are many instances in the bible describing the preparation and planning to carry out God's will; consider the story of Paul working with the Colossians and Laodiceans attempting to bring them development and understanding of Christ's life and teachings. Paul directed the people he had taught and mentored to build a church. Paul acted as the Scrum Master for the church construction project. The remote team worked under his supervision while Paul oversaw things from afar.

For I want you to know how great a struggle I have for you and for those at Laodicea and for all who have not seen me face to face, that their hearts may be encouraged, being knit together in love, to reach all the riches of full assurance of understanding and the knowledge of God's mystery, which is Christ, in whom are hidden all the treasures of wisdom and knowledge. I say this in order that no one may delude you with plausible arguments. For though I am absent in body, yet I am with you in spirit, rejoicing to see your good order and the firmness of your faith in Christ (Holy Bible, English Standard Version, 2001/2016, Col. 2:1-23).

Although Paul was physically distant, he was present in spirit. Paul realized that false prophets were trying to influence the Colossians, but Paul cared about them, heard their prayers, wrote to them, and continued teaching them. In this way, Paul managed the project, removing obstacles, supporting his team through the chaos, and mitigating risk. Like a Scrum Master's duty to foster Agile values and principles, Paul encouraged the
Colossians by fortifying their faith and beliefs to be firm and disciplined, rendering them within the theological borders of Christianity.

**Relationship to the Field of Study**

Within business administration, project management is a specific practice that focuses on initiating, planning, implementing, controlling, monitoring, and eventually closing the work of a team to achieve particular goals, defined as customer requirements, within a limited time frame and budget. The project's primary objective is to accomplish all the plans according to the assigned constraints. Furthermore, a project is defined as a temporary undertaking conceived to produce a one-of-a-kind product, service, or result with a defined beginning and end (Project Management Institute, 2017a).

There are several approaches to project management, predominately waterfall, traditional approach, or an Agile style. While waterfall methodology has been the predominant project approach in the past, Agile methods are quickly gaining recognition due to inherent benefits such as improved staff motivation and satisfaction, improved control of customer requirements, higher quality deliverables, and added value to the implementing organization (Azanha et al., 2017). However, Agile methodologies are challenging to implement for numerous reasons, including management's reluctance to relinquish control to a self-directed team (Parker et al., 2015). There is a limited understanding of the detrimental effects of self-organized teams concerning remote team engagement and productivity (Parker et al., 2015). Within this realm of project management, this study attempted to address Agile difficulties regarding Scrum Master engagement to influence remote team members' productivity. While ample rhetoric exists concerning the adaption of Agile methods based on self-organized teams, there is a lack of comprehension of the effect of leadership style on these teams and the resulting impact on
productivity (Parker et al., 2015). Therefore, this study contributed to the extant literature by an increased understanding of distributed self-managed teams and the Scrum Master's leadership style to engage the team members.

**Definition of Terms**

The listed terms are used in the field of Agile project management and are defined below to provide understanding and clarity.

*Agile project management:* A project management approach frequently used in IT and software development that focuses on perpetual expansion and advancement of a project, product, or service. Projects are typically managed in sprints designed around small enhancements implemented incrementally during the sprint cycle (PMI, 2017b).

*Collaborative teams:* A central component of the Agile methodology is collaborative teams that are highly efficient in communicating and working together. By combining strong leadership and an environment of trust, teams take on a spirit of community and shared purpose to address customer requirements in creative and innovative ways (Calefato & Ebert, 2019; House, 2019).

*Distributed teams:* Team identification that refers to non-collocated members. Team members are geographically positioned around a country or the globe, offering the possibility to involve the correct talent pool and, in some cases, reduce costs. Globally disbursed teams provide the opportunity to achieve faster time-to-market results as well (Alzoubi et al., 2016).

*Scrum:* Agile Scrum methodology is a popular project management approach that utilizes strict management guidelines, including daily meetings, sprint planning, review sessions, and frequent retrospective meetings. A robust management framework enables the delivery of
developmental changes and improvements incrementally and consistently over short periods (Holzmann & Panizel, 2013; Qureshi et al., 2018).

**Self-organizing teams:** Self-organizing teams are a core concept of an Agile project management methodology. This type of group is described as self-managing, requiring minimal guidance and supervision fostered by the autonomy to select and accomplish tasks during the sprint cycle (Barke & Prechelt, 2019; Hoda & Murugesan, 2016).

**Transformational leadership:** A contemporary leadership theory based on leader behaviors that include a clear vision with the ability to communicate that vision and providing a framework to enable goal acceptance, articulation of performance expectations, and intellectual stimulus (Wong & Berntzen, 2019).

**Assumptions, Limitations, and Delimitations**

Assumptions made during the study, such as included facts but not validated, may have been used to assist the reader in understanding. As such, assumptions bear a potential risk, and mitigation opportunities were discussed for each assumption. Limitations were noted to ascertain the possible weaknesses of the study. Lastly, delimitations were included to provide the reader with information on the study's boundaries and scope.

**Assumptions**

The objectivity of participants: It was assumed that all respondents were selected randomly from the sample organization. It was also assumed that all answers were straightforward and honest. There are no right or wrong answers to the interview questions, and this was indicated to study participants to render non-biased responses. Furthermore, study participants are entirely anonymous to avoid influence from differing opinions, beliefs, attitudes, and experiences of other participants or observers. It was also assumed that study participants
responded to the interview request in a timely fashion. Lastly, there was a potential risk that interviewees worked together and, via random circumstances, knew each other and shared knowledge or thoughts about the study. Every effort was made to identify study participants from various organizational departments.

Awareness of Agile Scrum project methodologies: All study participants were assumed to be familiar with Agile Scrum principles and methods and have had experience as Scrum Masters or Agile Masters. The definition of these roles was provided to each participant.

**Limitations**

The inexperience of the researcher. One of the study's main limitations was the inexperience of the researcher. Appropriate design and research techniques were performed along with standardized result interpretation and analysis derived from recent researcher studies to reduce misunderstandings and misrepresentation of the results. Although researcher inexperience was a valid concern of the project, this was offset by some measure with support from the business department, dissertation chair and committee, and other qualified experts who possess the necessary research experience.

The research for this study was conducted via personal interviews limited to Agile Scrum project members and Scrum Masters of a large multinational corporation. Due to the relatively small sample size, focusing on one organization instead of a national or global sample of Scrum practitioners, the results may not represent a larger population. Therefore, generalizations across broader populations may be skewed.

**Delimitations**

The specific demographic of participants for this study included current or previous members of Agile teams employed by the target organization. The participants selected were
directly involved in projects utilizing distributed remote teams within an Agile Scrum framework. The study did not consider age, gender, or years of experience regarding participant selection.

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

The literature review provides an examination of related professional and academic research concerning factors that have led to the expansion of project management to include Agile methodologies, particularly in the information technology sector. This review also provides an overview of the differences between traditional project management approaches and the newer Agile methods considering both advantages and limitations of each technique. Additionally, the roles and processes of Agile project management were explored in detail. Finally, leadership, management, and project management theories were discussed concerning their impact on Scrum Masters and how these concepts affect management and communication with the Agile team members.

**Project Management**

The Project Management Institute defines a project as a transitory effort in an attempt to establish a unique product or service (PMI, 2017a). A project differs from normal business processes because, unlike operations, projects have a structured timeline identifying the beginning and end dates (Larson & Gray, 2018). Projects involve one or more elements that are new and unique. For example, while the construction of an office building is not new, the location, design, customization, and resources result in a singular product and, therefore, are deemed a project. Larson and Gray (2018) further defined projects as the impetus of an organization’s strategic vision, as projects determine and support how strategic planning is
realized. Project management is the application of knowledge, abilities, and techniques to project tasks to achieve project objectives (PMI, 2017a).

**Brief History of Project Management**

Project management is not a new approach or management tool. The fundamental principle of project management is to establish an environment where people can work together to achieve a common objective and deliver successful projects on schedule and within budget. Throughout history, humans have strived to improve and enhance project management practices with endeavors ranging from Rome's Coliseum to China's Great Wall and Egypt's pyramids (Lei et al., 2017; Seymour & Hussein, 2014). These outstanding accomplishments used the equivalent of modern-day architects, engineers, and project managers (Kozak-Holland, 2011). As mentioned previously in the biblical integration, ideas and concepts related to the management of tasks have been used since early man started planning, building, and developing. While documentation of those first projects is scarce, there is a plethora of challenging examples where projects were successfully concluded, despite the numerous risks, uncertainties, and complications that could have caused the project to fail (Seymour & Hussein, 2014). When considering the enormity of some of the projects, it is clear many required massive workforces, years of planning, and detailed monitoring and control to execute these engineering feats (Lei et al., 2017).

**Early Methods.** History is peppered with projects that indicate a good understanding of project management principles, including project sponsorship, project management teams, and adherence to project management type processes, without which knowledge the projects expectedly would not have succeeded. Review of historical references to groups of tasks being carried out to achieve a goal set the basis for project management. Kozak-Holland (2011)
indicated that lessons learned from the ancient projects helped build significant knowledge that aided the evolution of current project management practices.

Early projects were typically carried out by craftsmen or tribes with specialized talents and methods, who, in all likelihood, were uneducated and reluctant to share trade secrets (Chiu, 2011). Additionally, according to Chiu (2011), project management at the time was not considered a profession, and therefore, projects were not documented extensively, as were medicine, science, and mathematics. Lastly, the educated sponsors of early projects were not so much interested in the mechanics of the project, but the results, consequently accepting the lack of documentation (Chiu, 2011). Although documented evidence of ancient projects is scarce, the pyramids of Egypt provide a physical representation of the application of lessons learned. Before the completion of the Great Pyramid of Giza, the Egyptians had over 300 years of experience to perfect their techniques (Chiu, 2011). Procter and Kozak-Holland (2019) discussed the many challenges the Egyptians faced, yet as each new structure was built, the limited resources were pushed to higher aspirations. The pyramid builders changed and modified their building methods based on experiences and fluctuating situations. The impressive endurance of the Giza Pyramid can be credited to the flexibility of the builders to adapt lessons learned, implying a culture of organizational learning similar to today's Agile methods (Procter & Kozak-Holland, 2019). The building practices of the Egyptians evolved from mud bricks to limestone and eventually granite. Likewise, pyramids transformed from layered step-by-step brick to smooth triangular sides, and the angles of inclination were adjusted to build more robust and durable structures. These continuous improvements over hundreds of years resulted in significant changes that enabled increased pyramid size and complexity that buttressed internal passages and compartments (Procter & Kozak-Holland, 2019).
Over time, projects became more institutionalized, identifying division of labor and conceptualizing roles and activities. Near the end of the 15th-century, projects transitioned from improvised endeavors to rationalized preparation, separating design from execution (Garel, 2013). As attention to project detail increased, scope and consideration of economic factors and resources garnered a position in project development (Garel, 2013). Although a standard model of project management had yet to be defined, these incremental improvements debunked the myths of early projects such as boundless budgets with no return, predominate use of forced labor, unlimited timelines and schedules, and no utilization of concepts that would later be associated with standardized project management processes (Garel, 2013; Kozak-Holland, 2011).

**Modern Methods.** While there is disagreement among scholars as to when modern project management began, the twentieth century provided fast-forward momentum of significant development. During the early part of the 1900s, both Henri Fayol and Henry Gantt gained prominence in the field of management. Fayol classified five universal principles of management. Serving in the capacity of engineer for a French iron and steel company, Fayol observed managers routinely planning, organizing, commanding, coordinating, and controlling (Seymour & Hussein, 2014). Additionally, Fayol is credited with developing fourteen principles that guide management execution of the five main philosophies, making significant advancements in management theory and key building blocks of project management (Seymour & Hussein, 2014; Voxted, 2017).

Henry Gantt, a well-known engineer and management consultant acknowledged for developing the Gantt chart, recognized the benefit of breaking down large tasks and the dependency between tasks (Darmody, 2007; Seymour & Hussein, 2014). During World War I and the period following the war, Gantt charts were used for military and large infrastructure
projects, leading to significant recognition and eventual global dissemination and usage of the charts (Seymour & Hussein, 2014).

Interestingly, one specific large infrastructure project, the Hoover Dam, was completed ahead of schedule and under budget despite the socio-economic hardships of the 1930s, and the project was critical in ushering in an era of project management fundamentals that would further shape modern project management practices (Kwak et al., 2014). During this time, project management changed from a craft or builder approach to a human relationship focus as improved transportation and communication methods supported increased flexibility and enhanced idea exchange capabilities (Kwak et al., 2014). Additionally, during this first quarter of the twentieth century, the idea of task description progressed, which highlighted the knowledge, skills, and talents needed to successfully perform a specific activity (Kwak et al., 2014). These large-scale projects, the Hoover Dam, the Manhattan Project, and other infrastructure projects, were the imputes of modern-day project management norms such as organization, planning, and direction, which prompted the growth of standard procedures for managing projects (Garel, 2013; Kwak et al., 2014).

Prior to the advancement of normalized processes, organizations held the knowledge of project work and operated in much the same fashion as early craftsmen and guilds (Garel, 2013). The development of the critical path method (CPM) and program evaluation review technique (PERT) was recognized as the start of the contemporary phase of project management development (Seymour & Hussein, 2014). These methods, along with the change in urgency to adhere to strict deadlines during Cold War armament projects, the standardization of project management commenced (Garel, 2013).
Starting in the late 1960s, project management gained its foothold as an autonomous field of knowledge championed by management tools and the establishment of associations such as the Project Management Institute (Garel, 2013). Therefore, project management standard practice and tool development coincided with the expansion of the field. The organization of professional associations defined the core activities and processes that are used globally and recognized as industry best practices backed by project-proven tools and methods (Hällgren et al., 2012). Increasing technological advancements such as the rise of personal computers, enhanced computing power, and the development of additional tools like Critical Chain Project Management (CCPM) and the Theory of Constraints (TOC) continue to drive the standardization and how projects are managed (Seymour & Hussein, 2014).

Advancements in science and technology have expedited the establishment of project management as a profession that is now widely accepted as the standard for good practice with identified skill sets and knowledge. Project management tools offer various models that consider globalization, resource limitations, customer demand, competition, and socio-economic issues that transform organizations and the environment in which they conduct business (Seymour & Hussein, 2014). Project managers need the flexibility and fluency to adapt to constant change and uncertainty. Being knowledgeable across the gamut of models will aid model selection in light of disruption and change.

**Waterfall Approach**

The Waterfall method is straightforward and straightforward to apply to any project or field (Crespo-Santiago & Cosme, 2011). The scholars indicated that the Waterfall project management approach is flexible enough for research projects, IT rollouts, and process design and re-engineering projects. Organizations utilizing a Waterfall approach will typically start with
a feasibility study to analyze the cost-benefit ratio and determine the effectiveness of the proposed project deliverables. System and functional requirements are evaluated next (Crespo-Santiago & Cosme, 2011; PMI, 2017a). The system, product, or service is then created with technical detail based on the functional requirements as defined by the customer (Crespo-Santiago & Cosme, 2011; PMI, 2017a). Following this, the project team begins development, customization, or production of the final product or service, followed by extensive testing and verification from both the project team and users (Crespo-Santiago & Cosme, 2011; PMI, 2017a). Lastly, the project can be completed with a maintenance phase, which allows for troubleshooting, modification, and new requirements (Crespo-Santiago & Cosme, 2011).

Many factors influence the choice of project method, but typically organizational susceptibility to change and the size of the project are significant considerations (Kisielnicki & Misiak, 2017). The waterfall method of project management is the traditional approach for project execution, but underlying project characteristics make it appropriate for specific projects and not for others. In a traditional waterfall approach, there is a high-level project definition, which is the foundation used to create a detailed plan guiding the execution of all project deliverables and milestones (Binder et al., 2014). Conventional project management models focus on planning and controlling, which many organizations consider essential to estimate and plan projects accurately. Unfortunately, the human aspect of the project is often overlooked in this case.

The Waterfall method assumes that once the initial requirements and goals of the project are defined, the path to project completion is cleared of obstacles and uncertainty (Andrei et al., 2019). However, in reality, customers frequently change their decisions and opinions of project
features requiring re-evaluation of some or all project phases, forcing changes to costs and timelines (Andrei et al., 2019).

*Phases of Waterfall Method*

![Phases of Waterfall Method](image)

**Figure 2.** Phases of Waterfall Method (Maassen, 2018; PMI, 2017a).

**Advantages of Waterfall.** The Waterfall method can be advantageous at times, such as when implementing smaller projects with fixed deadlines, budgets, and scope or in cases of recurring project rollouts (Andrei et al., 2019). This approach supports team organization by providing extensive documentation that maintains knowledge and experience that can be passed from member to member and aid in onboarding new team members. Additionally, each phase has a fixed time period, meaning the schedule can be distributed ideally across the various project stages. Further benefits of a Waterfall approach include maintaining the scope of the project to match the requirements and needs of all stakeholders, establishing cost control and time management for all tasks, and documentation of all activities and developments (Crespo-Santiago & Cosme, 2011). Using the Waterfall approach, the end-product or service displays
improved consistency because the design was completed during the beginning phases, and all details were taken into account. Although this project arrangement weakens the flexibility for considering customer changes and additions, it forms a structured and streamlined process for the team to follow (PMI, 2017a).

**Disadvantages of Waterfall.** The most profound weakness of the waterfall method is the extensive pre-planning that makes it difficult to change or include customer changes without major impacts on the budget and timeline (Cervone, 2011). Traditional project methodologies such as Waterfall use a logical sequencing of deliverables defined in advance of project start and project status based on performance during quality gate reviews (Andrei et al., 2019; Serrador & Pinto, 2015). While the Waterfall approach allows for optimal time allocation between the various project phases, if one task goes late, all the following tasks will suffer the same fate. The inflexibility of the Waterfall method to accommodate change can result in significant rework, customer dissatisfaction, and technological improvements that outpace the project (Serrador & Pinto, 2015). Serrador and Pinto (2015) stated that advanced planning defines the quality of the project. They indicated that when the quality of the project is achieved per the plan, the project is deemed successful whether or not the result is valuable or beneficial to the users or sponsors.

Furthermore, the requirements definition phase in a Waterfall project is frequently lengthy and labor-intensive resulting in requirements changing before the process is complete or development begins leading to significant depletion of the resource budget, further restricting the ability to accept changes (Cervone, 2011). Additionally, the majority of features and requirements are not realized until the end of the project, meaning the customer waits until the project's end to visualize the final result. Augustine et al. (2005) found that approximately 35% of requirements change during the project life cycle and that roughly 65% of characteristics
defined in the customer’s initial requirements are never or seldom used; traditional project
management approaches are not compatible with this type of complex and dynamic environment.
Furthermore, Waterfall projects are executed in a top-down fashion preventing the shift to
successive phases without management approval, and this can prove particularly troublesome in
bottom-up organizations or where change is driven by lower levels (Crespo-Santiago & Cosme,
2011).

**Agile Approach**

Over the last several decades, organizations have embraced innovation and digitalization
to bolster product and service diversification, increase revenue streams, and improve
productivity (Maassen, 2018). To address the emerging change in project management and
consider the human aspects of project management, Agile principles appeared in the late 1950s
and were formalized in 2001 with the creation of the Agile Manifesto (Binder et al., 2014). The
pitfalls of front-loading planning in traditional project planning methods have heightened the
acceptance of Agile project management methods to prevent downstream development issues.
Agile processes and principles are believed to increase and improve team productivity and boost
creativity and development by concentrating on short-range deliverables yet tolerating the
intrinsic ambiguities of future tasks (Binder et al., 2014).

Agile projects focus on changing customer needs and integrating changing customer
priorities (Maassen, 2018). Projects managed in an Agile fashion progress in iterations.
Consequently, features and attributes of the product or service display the actual functionalities
demanded by the users and organizations. This promotes project delivery that directly impacts
the business’s most valuable aspects. During an Agile project, teams work on various solution
elements simultaneously in three to four weeks sprint durations. With each sprint, the customer
prioritized features or products are supplied, resulting in every iteration representing a working product.

**Agile Sprint Flow**

![Agile Sprint Flow Diagram](image)

**Figure 3.** Agile Sprint Flow (Project Management Institute, 2017b).

**Advantages of Agile.** Increasingly, projects encompass innovation and require flexibility and adaptiveness to dynamically fluid requirements. This environment results in evolving requirements met with increased delivery speed and performance. In a traditional waterfall project, constant change entails considerable effort to update planning (Lei et al., 2017). An Agile project management approach is frequently utilized in this type of case due to the inherent techniques that aid in adaptation and absorption of scope and characteristic changes (Azanha et al., 2017; Kumar & Shankar, 2016). Additionally, Serrador and Pinto (2015) found that the project success rate was directly related to the use of Agile methods, clearly indicating that increased usage of Agile techniques leads to greater project success. There is general agreement among scholars that Agile project management improves flexibility, simplifies the project process, and iterations in short sprints of time add value for the customer (Boehm, 2002; Dingsøyr et al., 2012; Novac & Ciochină, 2018).
Agility enables quick project adjustment by fostering an environment that adapts to changes brought about by innovation or changing requirements (Papadakis & Tsironis, 2018). An Agile project's culture is more collaborative between customers and the project team, which aids in faster delivery and increased customer alignment on features and quality expectations (Kumar & Shankar, 2016). Additionally, as the project manager acts as a facilitator and the project team is self-organized, the group has greater integration, motivation, and morale. And although there is constant planning of the project through sprint iterations, risks are minimized, and customer satisfaction increases due to the continual analysis and feedback loop between the customer and the team (Serrador & Pinto, 2015).

**Disadvantages of Agile.** There are challenges in implementing Agile methods because of conflicts with business processes such as procurement and knowledge management and the fundamental level of uncertainty and ambiguity relating to iterative approaches (Boehm & Turner, 2005). Agile characteristics such as the lack of extensive documentation usually required for training and support plus its suitability for small teams, and the self-organizing nature of its project teams, are areas that may encounter corporate policy and procedure barriers (Boehm & Turner, 2005).

For some organizations, Agile methods can be too short-term driven. The adaptability and productivity required for identifying tasks for the development team can inflict difficulty in keeping long-term goals in focus (Cooper & Sommer, 2018). Additionally, an Agile approach can cause confusion in confirming whether the project should be included in the organization’s project portfolio due to the fluidity and ambiguity in product definition (Cooper & Sommer, 2019).
Project metrics can be challenging for Agile projects. The plan-based approach common to traditional project methods allows for leadership to gauge the progress and value of the project by reviewing progress towards critical milestones and budget adherence. It is more difficult to access by schedule alone in the Agile environment if the project should continue easily. Agile projects require senior management to accept an innovative mindset and new metrics to measure the health and progress of the project, accentuating value creation rather than progress against a schedule (Cooper & Sommer, 2019). Without proper management support and experienced leaders, the scope of an Agile project can quickly lose focus and direction (Kumar & Shankar, 2016).

**Table 1**

*Comparison of Waterfall and Agile*

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Waterfall</th>
<th>Agile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Importance</td>
<td>Process</td>
<td>People</td>
</tr>
<tr>
<td>Focus</td>
<td>Predictable</td>
<td>Exploratory</td>
</tr>
<tr>
<td>Documentation</td>
<td>Comprehensive</td>
<td>As required</td>
</tr>
<tr>
<td>Quality</td>
<td>Process focused</td>
<td>Customer-centric</td>
</tr>
<tr>
<td>Process design</td>
<td>Linear</td>
<td>Iterative</td>
</tr>
<tr>
<td>Teams</td>
<td>Managed</td>
<td>Self-organized</td>
</tr>
<tr>
<td>Pre-planning</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Changeability</td>
<td>Sustainable</td>
<td>Adaptable</td>
</tr>
<tr>
<td>Requirements</td>
<td>Fixed</td>
<td>based on business value; regularly updated</td>
</tr>
<tr>
<td>Management style</td>
<td>Autocratic</td>
<td>Decentralized</td>
</tr>
<tr>
<td>Leadership</td>
<td>command &amp; control</td>
<td>Collaborative, servant leadership</td>
</tr>
<tr>
<td>Key performance measures</td>
<td>Plan conformity</td>
<td>Business value</td>
</tr>
<tr>
<td>Return on investment</td>
<td>End of project life</td>
<td>Early/continuous</td>
</tr>
</tbody>
</table>

Comparison of Waterfall and Agile (Kisielnicki & Misiak, 201, p. 274).
Agile Methodologies

Agile software development led to Agile project management (Cervone, 2011). Even with early ideas of Agile project management linked to work by Takeuchi and Nonaka in 1986, the framework never found much of a following until 1995 (Cervone, 2011; Lei et al., 2017; Van Ruler, 2019). It was determined that traditional approaches to project management were not suitable for the experimental, changeable, and the unique nature of projects in the software industry (Azanha et al., 2017; Cervone, 2011). Agile project management methods have experienced such a spike in acceptance because of the apparent ability to accept customer changes quickly and simply (Azanha et al., 2017; Özkan & Mishra, 2019). According to Özkan and Mishra (2019), 71% of companies that report using Agile project management indicate projects were 28% more successful than those managed under traditional project management methods.

Although there are several different variations of Agile project management, the main guiding principles of the Agile Manifesto are generally accurate. The first item in the Manifesto states that associates and their exchanges are more important than techniques and methods (Cervone, 2011; Saini et al., 2018; Skowronski, 2004). Secondly, a usable product or service is more important than extensive or comprehensive documentation (Cervone, 2011; López-Alcarria et al., 2019; Skowronski, 2004). Additionally, continual feedback from the customer raises the importance of a collaborative environment over contract discussions (Cervone, 2011; López-Alcarria et al., 2019; Skowronski, 2004). Lastly, combining the customer’s feedback with the development plan signifies the importance of addressing change over the need to stick to the project plan (Cervone, 2011; López-Alcarria et al., 2019; Skowronski, 2004).
Relevant Agile Approaches

Scrum. Cervone (2011) indicated Scrum is the Agile approach most frequently used by organizations. Additionally, Agile Scrum project management is the most popular and widely accepted Agile approach, with approximately 70% of Agile projects selecting a Scrum approach (Cervone, 2011; Özkan & Mishra, 2019). Scrum is an incremental and iterative project management method where success depends on close collaboration and interaction between team members (Hidalgo, 2019; Zada et al., 2015). The term Scrum comes from the game of rugby, where teams are organized and self-managed yet must collaborate and coordinate to gain possession of the ball (Azanha et al., 2017). Notably, these characteristics of a rugby team are identifiable in an Agile Scrum project team as well (Bonassa & Carvalho, 2016).

Although many Agile approaches are related to software development, Scrum is not a software development tool but a framework for managing projects (Hohl et al., 2018; Rola et al., 2016). The Scrum methodology is supported by three pillars, team member roles, the definition of processes, and user stories (Cervone, 2011). A team lead, or module owner normally assumes the role of Scrum Master and is responsible for fostering Scrum values and practices and removing barriers to enhance the team’s progress (Hidalgo, 2019). The removal of obstacles is the most crucial task of the Scrum Master (Cervone, 2011). A Scrum team typically consists of five to ten cross-functional members that are self-organizing and work in two to three-week cycles known as sprints (Azanha et al., 2017). In this version of Agile project management, the product owner defines the user stories indicating what needs to be built or developed and how each user story should be addressed during the sprint.

There are five fundamental tasks in the Scrum process, kickoff, sprint planning meeting, the sprint, daily Scrum meetings, and the sprint review (Bonassa & Carvalho, 2016; Pardo-
Calvache et al., 2019). The Scrum Master, the team, and the product owner discuss and plan the next sprint during the sprint planning meeting. These meetings typically span one to two days, where the backlog and product requirements list are reviewed and evaluated. Secondly, the upcoming sprint goal is defined, which identifies the expected outcomes of the sprint. Once the user cases for the next sprint are determined, the kickoff meetings initiate the sprint.

A sprint differs from traditional project phases in a couple of ways. Sprints are defined in two to three-week cycles, based on completing identified user stories as opposed to the phase of a waterfall project, which represents significant sections of the project (Cervone, 2011; Hidalgo, 2019). Additionally, at the end of a sprint, new workable features of the product are released for use (Bonassa & Carvalho, 2016). Another differentiating feature of an Agile Scrum project is that no changes are allowed to project requirements during the sprint. The Scrum Master is responsible for removing obstacles to the team’s progress, preventing interference and distraction (Cervone, 2011).

As part of the sprint planning meeting, the team reviews the backlog of user stories and provides an estimate for completion. The forecast is typically based on team member expertise or using a work breakdown structure. The user story estimates are used to determine the approximate amount of work in person-days that will be required to complete the story. Based on these estimates, the team can determine the volume of user stories accommodated during each sprint.

Scrum meetings are held daily, typically in the morning or near the day’s start (Stray et al., 2018). The meeting is no more than 15 minutes in length and is run by the Scrum Master. Each team member briefly reviews what they did since the last Scrum meeting (yesterday), what will be done until the next Scrum meeting (tomorrow), and what obstacles impede completing
the work (Stray et al., 2018; Zada et al., 2015). The daily meeting is not for problem-solving or progress checking. Still, it allows team members to interact and communicate with each other and the Scrum Master to ensure work can proceed as quickly and efficiently as possible. The sprint backlog differs from the product backlog. The sprint backlog is a subset of the product backlog defined by the Scrum team members. The sprint backlog is updated daily by team members as tasks are completed. It is up to the team members, not the Scrum Master, to add or remove tasks from the sprint backlog.

At the end of each sprint, a sprint review meeting is held. The new features completed during the sprint are shown to the product owner and project sponsors. Relevant user stories and documentation are updated, and any incomplete user stories are added to the backlog. It is worth noting that unfinished user stories should be a rare occurrence. Pertinent to self-organizing teams, each team member selects their own user stories for the sprint and is expected to complete those chosen during the sprint iteration (Cervone, 2011).

**Kanban.** Another Agile project management tool is Kanban. This approach focuses on delivering work when needed, highlighting a “just-in-time” delivery mentality (Lei et al., 2017). The arrangement prioritization of tasks and definition of a detailed workflow aids in accurately planning what work is required and when it should be completed. The process prioritizes work activities that require careful consideration to mitigate the risk of schedule overruns and enhance the flexibility of all project activities. While Agile guiding principles are applicable in Kanban development as well, there are six additional norms relating specifically to this methodology.

1. Minimize work in process
2. Pull instead of push value through the development process
3. Enable development transparency
4. Increase throughput

5. Maintain a predetermined backlog

6. Sustain quality throughout the entire process (Ahmad et al., 2016; Lei et al., 2017).

Aligned with Agile processes, the Kanban approach concentrates on completing the required tasks at the correct time based on the team's skills. Each team member has unique skills and work capacity. User stories or project components are selected and implemented based on value-added. Additionally, the Kanban methodology seeks to eliminate waste by not developing unrequested features, not accepting more user stories than can be finished in a sprint, and not testing more characteristics that can be deployed during that sprint (Santos et al., 2018).

A prominent feature of the Kanban approach is the visualization of the project tasks. The Kanban board is used to display all activities required for implementing the project (Ahmad et al., 2016). Each activity is written on a card and added to the backlog. When an activity is completed in the first stage, it is moved to the second stage; a new task from the backlog is then added to the first stage (Lei et al., 2017). Each task travels through the process in steps until it is completed. A finite number of activities can be placed in each stage (Santos et al., 2018). The maximum number of activities is used to control the flow of tasks and ensure just-in-time delivery. Utilizing colorful cards, the high visibility of the Kanban method enables all team members to see the project status at a glance (Ahmad et al., 2016). The Kanban board provides an easy system for displaying bottlenecks where overloading tasks occur and where there are potential gaps in workflows (Ahmad et al., 2016). Overall, the Kanban board is helpful for tracking time, cost, and constraints to successfully meet project due dates (Lei et al., 2017). Kanban and Scrum are similar project management approaches and are often used in tandem (Kniberg & Skarin, 2009). Both processes focus on the breakdown of project activities into
discernable tasks, promote self-organizing teams, focus on delivering customer requirements, adapting quickly to change, demand transparency, and use a pull approach to addressing priorities (Ganjeizadeh et al., 2014; Kniberg & Skarin, 2009). Additionally, both Kanban and Scrum encompass feedback and improvement procedures and balance project scope by placing importance on providing value and achieving deliverables (Al-Baik & Miller, 2014).

There are, however, some differences between the two approaches. Kanban works well with larger teams, where deep collaboration and innovation are not predominant (Lei et al., 2017). Combining features of both Scrum and Kanban allows for increased visualization, larger collaborative teams, and rapid adjustment to changes while simultaneously achieving customer requirements (Al-Baik & Miller, 2014; Harzl, 2017).

Lean. In the realm of software development, there are numerous methodologies for developing a product that meets the customers’ requirements and value expectations. The Lean approach was adapted from the Toyota Production System and sought to eliminate waste, typically in manufacturing (Kumar & Shankar, 2016). While mainly focused on waste reduction and system optimization, Lean has proved extraordinarily successful in manufacturing and gained the notice of software developers (Kumar & Shankar, 2016). In the early 2000s, Lean processes were introduced into the software development environment with the primary goal of improving processes and increasing efficiency (Kumar & Shankar, 2016).

A Lean approach fits well within Agile project management, fostering continuous improvement (Lemieux et al., 2015). Together, iteration planning and retrospectives encourage continual review and prioritization of tasks (Lemieux et al., 2015). Additionally, combining both processes addresses risk by attempting to minimize risk throughout the project and address any known risk as soon as possible. The two approaches were used in tandem to aid organizations in
aligning the mission and vision and improving the service provided to the end customer (Lemieux et al., 2015). Lean and Agile processes tackle work on high-priority activities, assume there will be changes in task assignment and alignment, and seek to deliver a working product during each sprint (Dharmapal & Sikamani, 2014). In light of this arrangement, even in cases where the project is ended early, value is still delivered to the customer, return on investment can be calculated, risk has been reduced, communication has been maintained, and a viable product or service, albeit fewer features, can be brought to market (Dharmapal & Sikamani, 2014; Lemieux et al., 2015). This generally leads to improved customer satisfaction and project metric assessment capability (Dharmapal & Sikamani, 2014). The following are Lean principles.

1. Eliminate waste
2. Increase and focus on learning
3. Make a final decision later rather than earlier
4. Delivery improvements or features as quickly as possible
5. Empower the project team
6. Cultivate integrity
7. Visualize the process as a whole (Kumar & Shankar, 2016).

**Significant Agile Research**

**Significant Research on Agile Methodology.** With market uncertainty increasing and innovation cycles developing faster and faster, a paradigm shift to Agile methodologies is being witnessed across the globe (Schuh et al., 2018). Additionally, with the rapid development of communication applications and the continuing trend of digitalization, organizations are faced with increasing demand to reduce product development times, shorten product lifecycles, increase customization, and remain globally competitive (Dingsoyr et al., 2019). Although Agile
development was initially focused on small or simple projects, current research and business experimentation are focusing on the appropriateness and ability of Agile Project Management to accommodate more extensive and more complex projects (Dingsøyr & Moe, 2014). This current trend pushes development from macro to micro occurrences, resulting in shrunken lot sizes based on the desire for product varieties (Schuh et al., 2018).

A recent global study revealed managers predict this trend to continue and expect it to increase, emphasizing a need for adaptable and flexible project management approaches (Bonassa & Carvalho, 2016; Schuh et al., 2018). Current research explores the capabilities of modifying the Scrum Agile approach to project management to address more significant and distributed teams (Dumitriu et al., 2019; Gill et al., 2018; Schuh et al., 2018). While there is consensus that Agile methodologies should be adjusted or modified to accommodate large-scale and complex projects, there are varying opinions on a standard solution (Dumitriu et al., 2019). Larman and Vodde (2010) and Bass and Haxby (2019) suggested increased responsibilities for product owners to complement a larger number of teams and locations of those teams. Combining certain aspects of Agile and traditional project management methods has also been proposed and thus far has proved to be a significant challenge in actual practice (Ebert & Paasivaara, 2017; Gill et al., 2018). Although Agile project management is considered a standard framework for smaller projects, such as IT and software development projects (Ebert & Paasivaara, 2017), the research will continue as ideas and contextual factors impact the success or failure of maturing processes (Heikkilä et al., 2017).

**Agile Project Roles.** There are three specifically defined roles in Scrum Agile project management. The product owner determines the requirements and attempts to enhance product value for the customer by turning the backlog of requirements into developed features in timed
sprints (Barke & Prechelt, 2019; Conboy & Carroll, 2019; Sibona et al., 2018). The second role, Scrum Master, acts as the coach and team organizer supporting members in grasping Scrum theory, procedures, and principles (Barke & Prechelt, 2019; Conboy & Carroll, 2019; Sibona et al., 2018). The third role in Agile Scrum projects is the Scrum team itself. The roles are purposely limited as the Scrum team is self-organizing, and all other Scrum tools and processes are merely to support self-organization, agility, and speed throughout the sprint (Barke & Prechelt, 2019; Dingsoyr et al., 2019).

The central precept of Agile projects is the focus on self-organizing teams. The foundation of a reliable team is based on autonomy, communication, and collaboration; however, the division of labor that stems from each team member’s specialized skills can impose barriers to those building blocks (Barke & Prechelt, 2019). Hoda et al. (2013) explained that this team setup requires a balance between cross-functionality and specialization and continuous learning versus iteration speed. Role clarity aids the team members in-process visibility, negotiation, and control for teams and each team member. In a recent study by Barke and Prechelt (2019), the author’s work suggests role clarity results in smoother daily work, reduced team member turnover, and acceleration of team maturation.

**Value of Agile Approaches.** Rigby et al. (2016) stated that Agile approaches offer well-documented benefits, such as significantly improving team productivity and associate satisfaction. Agile practices can also provide opportunities to reduce project waste, such as unnecessary meetings, repetitive preparation and organization, excessive documentation, quality issues, and non-value-add product characteristics (Rigby et al., 2016). An Agile approach focuses on the customer and meeting their requirements and goals instead of traditional methods that can unduly exert pressure or influence development (Amstel et al., 2017). With expanded
visibility and constant adjustment to shifting priorities and requirements, Agile techniques improve customer engagement, lower project risk, and bring products, processes, or features quickly and predictably to market (Kramer & Heuvel, 2019; Rigby et al., 2016). The customer-oriented approach and self-organizing teams of the Scrum methodology allow for scope flexibility and prioritization based on the end-user and customer needs (Amstel et al., 2017). Agile principles promote a scope that is based on the customer’s vision and requirements, singularly focusing on customer satisfaction and added value even in the case of fluid concept and reprioritization (Kramer & Heuvel, 2019). Also, involving team members as collaborative colleagues expands the organization’s experience and encourages mutual trust and respect (Rigby et al., 2016). Furthermore, by abolishing redundancy and persistent supervision, senior leaders can focus on high-value work, removing obstacles to progress, and boosting cross-functional teamwork (Rigby et al., 2016).

**Challenges of Agile Approaches.** Many organizations worldwide have implemented or tried to implement an Agile project management approach. Unfortunately, many teams are unprepared for the significant differences in traditional methods and struggle due to organizational behaviors and culture (Loiro et al., 2019). Additionally, to fully achieve organizational agility, it is necessary to critically analyze the importance of data from all sources. Particularly in IT and software projects, information is vital and can prove problematic in attaining Agile advantages (Loiro et al., 2019).

Perhaps the most arduous demand of Agile project management is the formation and stabilization of the project teams. Self-organizing teams can be challenging to establish and leverage their advantages. Furthermore, the team’s ability to communicate with team-mates, stakeholders, and other colleagues requires monitoring, controlling, and continuous
improvement. One additional barrier to adopting Agile approaches is senior leader incomprehension of Agile methodologies and the continual implementation of conventional management practices that undermine and circumvent the basic principles of Agile projects (Rigby et al., 2016). The following are typical challenges of implementing Agile methodologies.

1. Definition and clarify of roles and concepts
2. Readiness and adaptability to change
3. Finding balance between organization philosophies and project structure
4. Leader knowledge (Conboy & Carroll, 2019; Loiro et al., 2019).

**Agile Project Teams**

A team is defined as a small group of people with complementary talents and capabilities (Dingsoyr et al., 2016). The team is dedicated to a collective purpose with a specific group of performance targets for which they are held mutually responsible (Dingsoyr et al., 2016). Therefore, a team has common activities, and members relate socially and experience the same organizational environment (Dingsoyr et al., 2016).

There are many factors to consider and analyze in understanding teams. For example, a team may be evaluated on productivity, speed, and ability to produce new or innovative results (Fagerholm et al., 2015). Teams can also be gauged on process control or knowledge output ((Fagerholm et al., 2015). As many IT-related projects are human-based, the project result is, therefore, dependent on human factors. Motivation, personality, team member satisfaction, and member value perception are essential factors to consider when forming a team, developing processes, and cultivating an environment that promotes communication and collaboration. Fagerholm et al. (2015) stated that there is a lack of understanding in IT projects regarding how
team members experience the struggle for better performance and attempt to positively experience project work.

**Co-located Teams**

Agile project management was predicated on co-located teams (Takpuie & Tanner, 2016). This approach to project management focuses on team collaboration through frequent face-to-face communication and close physical proximity (Rola et al., 2016). The success of Agile projects relies on team integration to foster member alliances to improve collaboration (Ibrahim et al., 2018). Co-located teams quickly increase communication and appear to disseminate project information more efficiently through frequent verbal communication and member interaction (Takpuie & Tanner, 2016).

Collective ownership of requirements and the overall project is crucial in Agile projects (Freire et al., 2018). In this environment, it is expected each member could replace another without significant disruption, even sharing leadership responsibility as necessary (Freire et al., 2018). Additionally, Agile projects provide team members the opportunities to collaborate and increase communication, mainly working synchronously and cohesively, maintaining the team’s goals as a top priority without unsolicited interference from management (Freire et al., 2018).

**Distributed Teams**

Agile project teams are typically multidisciplinary, highly autonomous, independent, and task-oriented (Denning, 2016). Combined with Agile practices, geographically disbursed teams offer many advantages such as low cost, the chance to recruit the most talented team members, and faster time to market (Alzoubi et al., 2016). Large multi-national organizations are relying increasingly on virtual teams instead of co-located ones, but despite the benefits mentioned, there
are numerous challenges as well as continued project failures (Alzoubi et al., 2016; Schmidt & Meures, 2016).

Information technology projects are frequently outsourced to either external vendors or external contractors. Increased internet-based technologies have led to improved collaboration services and continued the increased usage of external sourcing (Schmidt & Meures, 2016). However, these teams frequently come from varying cultures, countries, time zones, and languages (Schmidt & Meures, 2016).

Joining an Agile methodology with distributed teams intensifies the gravity of risks transpiring because these two approaches are in direct conflict with each other (Shrivastava & Rathod, 2014). Distributed teams require formal communication methods and channels (Schmidt & Meures, 2016; Xia et al., 2015). On the other hand, Agile methods are built on informal interactions with co-located teams working in close collaboration (Rola et al., 2016). Agile projects emphasize delivering working products by reducing the need for formal processes and documentation, which helps the teams adapt and react to the changes brought about by unpredictable situations (Shrivastava & Rathod, 2014). Additional Agile practices such as face-to-face communication, self-organizing teams, retrospectives, and stand-up meetings become further tricky using remote teams (Shrivastava & Rathod, 2014). These challenges may impact the project communication, coordination, and collaboration processes, hence posing significant risks that need to be considered to successfully complete the project (Dorairaj et al., 2012; Xia et al., 2015).

Distributed teams' lack of conformity to Agile practices leads to poor team member socialization, unsatisfactory socio-cultural adjustment, and inconsistent work standards (Moe & Šmite, 2008). This reduction in predicting interactions and communication impacts conflict
handling and trust between team members (Moe & Šmite, 2008). A deficiency of trust between teammates negatively impacts productivity, quality, and morale, resulting in less communication and feedback and a tendency for members to prioritize individual goals as opposed to group goals (Dorairaj et al., 2012; Moe & Šmite, 2008). Furthermore, research has shown the negative impact of virtual or remote teams on project success (Alashwal & Fong, 2015). A traditional disbursed project team can inhibit integration and collaboration, leading to project delays, cost overruns, lack of agreement, and conflict (Aapaoja et al., 2013; Alashwal & Fong, 2015).

Xia et al. (2015) found that remote teams required intense coordination at the local level, even more so than in co-located teams. The authors indicate, while not immediately apparent, local teams may not instantly recognize the immediate benefits of local coordination and, therefore, may not coordinate at the same level needed to optimize coordination in a global environment. Simply stated, leaders of globally disbursed projects and teams must address the different needs of their teams.

**Project Communication**

Communication is the exchange of information and managing relationships between different people or groups (Alzoubi et al., 2016). The synergy realized in combining Agile practices with successful communication allows the team to address and assimilate customer requirement changes during the project (Alzoubi et al., 2016) efficiently and effectively. The importance of effective communication is evident from these delineations. Agility is the basis of Agile projects and indicates how the team should address customer requirements and communicate. Alzoubi et al. (2016) stated that Agile projects concentrate on casual and relaxed exchanges among team members. Informal communication is personal, interactive, and peer-oriented communication, occurring outside formal structures and frequently without management
knowledge or inclusion (Barlow et al., 2011). Schmidt and Meures (2016) indicated that communication problems between project members are a crucial reason for project issues and even failure.

Distributed teams have increased obstacles to overcome, particularly communication between remote team members and customers (Alzoubi et al., 2016). Remote teams lack access to the shared visual information deemed commonplace for collocated teams, thus requiring the adaptation of communication channels (Gervits et al., 2016). Experts claim that Agile project management requires a different planning method, directly impacting communication (Van Ruler, 2019). Hallikainen (2011) stressed the value of having a well-built infrastructure for communication and collaboration, specifically to address the challenges of distributed teams. Delivering an incomplete or inadequate message, insufficient communication is a major risk in globally distributed Agile teams (Dingsøyr et al., 2014).

**Project Coordination and Collaboration**

One of the guiding principles of Agile projects is that features or small developments are delivered frequently in short iterations. This working method demands team coordination (Dingsoyr et al., 2019). Using a Scrum approach, this coordination is accomplished via the daily stand-up meetings, collective planning meetings, reviews, and sprint retrospectives (Dingsoyr et al., 2016).

IT projects typically have ambiguous requirements and diverse activities. Consequently, team members must coordinate and effectively adapt to changes in customer requirements and technology advances (Dingsoyr et al., 2016). Team members are expected to coordinate tasks, thereby overseeing the dependencies between activities (Balijepally et al., 2017). Dependencies can include common resources and tools, tasks, and related subtasks (Mtsweni, 2017). Managing
these dependencies requires communication to identify changing needs and connections, resulting in ongoing feedback, and ultimately improving the team’s performance (Mtsweni, 2017). Team members must have a mutual understanding of all tasks and interact with other members to harmonize processes and procedures to ensure maximum member contribution and collaboration (Defranco & Laplante, 2018).

Creating Agile, cross-functional, self-organizing, and multi-disciplinary teams where team members are globally disbursed is difficult to assemble (Ivan et al., 2019). The hiring responsible must evaluate each candidate’s technical and functional skills and assess each applicant's collaborative nature (Ivan et al., 2019). However, collaboration is a strategic topic for distributed Agile teams (Calefato & Ebert, 2019). Projects with remotely located team members often encounter fragmented processes, redundant information, and inconsistent data management (Calefato & Ebert, 2019). Effective and consistent collaboration is required to overcome insufficient transparency in enabling distributed resources to seamlessly share ideas, thoughts, concerns, progress, and priorities (Calefato & Ebert, 2019).

Agile Project Productivity

Productivity is widely considered the conversion process of input resources to output quantities (Forsythe, 2018). Productivity in IT projects is further defined by the relationship between the project's size and effort (Azzeh & Nassif, 2017). While this definition is quite simple, there is no standard equation for calculating project productivity (Azzeh & Nassif, 2017; Pai et al., 2015). Nevertheless, many influencing factors impact project productivities, including team interaction and communications and the number of deliverables or use cases (Graziotin et al., 2014). This calculation does not sufficiently encompass the requirement to estimate project effort before project commencement for quoting purposes and determining resource
requirements (Graziotin et al., 2014). Regardless of the incongruent measurement methods used, there is still criticism that large projects deliver relatively low productivity levels (Forsythe, 2018). Productivity is difficult to measure in practice due to issues in defining appropriate, valid, and reliable tools and data (Forsythe, 2018).

IT projects are notorious for delays, cost overruns, and quality issues. According to a recent study, less than 40% of IT projects are deemed successful; the other 60% were canceled, late, or over budget (Pai et al., 2015). Unfortunately, from most perspectives, only those who completed projects on time, within budget, and met customer expectations are considered successful (Pai et al., 2015). Additionally, Pai et al. (2015) indicated that quality substantially influences the efficiency and cost of IT projects.

**Organizational Culture**

As previously noted, Agile projects are people-centric, focusing on rapid iterative social interactions between and among team members (Gupta et al., 2019). Agile practices' general premise is recurring social and technical engagement and the need to institute regular schedules (Asnawi et al., 2011). The daily meetings, frequent sprints, and planning sessions require technical and social practices (Abdalhamid & Mishra, 2017). IT projects are socio-technical events making it vital that both aspects be considered to fully understand the impact on the Agile processes (Gupta et al., 2019). Typically, IT departmental culture poses a substantial hurdle to adopting Agile practices (Abdalhamid & Mishra, 2017). And while there has been significant research to explore the ideal Agile culture, transforming an existing organizational culture is extremely difficult (Gupta et al., 2019).

Organizational culture combines easily recognizable ideals such as the vision and value statements and the more subtle norms, behaviors, languages, and procedures (Dyer, 2018; Iivari
The seven pillars of productive work culture were defined by Dyer (2018). The seven pillars of effective workplace culture are:

1. Transparency
2. Positivity
3. Measurement
4. Acknowledgment
5. Uniqueness
6. Listening

Several of these cultural characteristics are also helpful in Agile practices (Iivari & Iivari, 2011). Transparency encourages communication, bringing common understanding and shared objectives and mission (Dyer, 2018; Iivari & Iivari, 2011). Dyer (2018) indicated that transparency increases performance and retains talented associates. Positivity focuses on a project’s or an organization’s strengths. Considering a team member's forte drives morale and promotes a realistic analysis of problems (Dyer, 2018). As in Agile planning and retrospective meetings, measurement gathers necessary feedback and tracks project achievements and customer satisfaction (Dyer, 2018). A project culture that acknowledges team member contribution and value further boosts member motivation and cohesion with the team (Dyer, 2018).

Additionally, uniqueness applies not only to the project or organization but also to the team members. Team members who feel well suited to their positions tend to stay with the project and expand its cultural aspects (Dyer, 2018). Project cultures that encourage active listening increase comprehension resulting in improved results and customer satisfaction (Dyer,
Lastly, when mistakes are regarded as learning experiences, projects and organizations realize increased innovation and team member morale (Dyer, 2018). While a hierarchical culture orientation is least beneficial to adapting Agile methodologies, a rational and responsive culture alignment increases productivity, efficiency, and goal achievement (Iivari & Iivari, 2011).

**Leadership Style**

Leadership is how an organization guides performance (Kanwal et al., 2019). Alamir et al. (2019) stated that leadership style affects team member behavior. Positive leadership behavior and actions drive positive outcomes, while non-supportive leadership threatens growth and innovation (Kanwal et al., 2019). A positive leadership style influences project outcomes and team members (Rao & Abdul, 2015). Leadership style plays a critical role in defining organizational culture and can inspire team members to act beyond self-interest and experience the benefits of collective group performance (Han et al., 2017).

Transformational leadership is realized by the leader’s behavior and actions, the leader’s ability to verbalize the vision, acknowledgment of project members’ individual goals, and adeptness to question preconceived ideas (Boies et al., 2015). Transformational leadership is a democratic method involving team members in decision-making and leads to higher employee motivation levels (Rao & Abdul, 2015). Transformational leaders are also involved in employee development, leading to participative leadership, allowing increased authority delegation and enhancement of team member self-worth, confidence, and group acceptance (Rao & Abdul, 2015). Past research confirmed that transformational leadership is linked to enhanced job satisfaction and effectiveness (Alamir et al., 2019). Associates with transformational leaders are more committed to the organization, indicated increased job satisfaction, and demonstrate higher performance levels (Alamir et al., 2019). In a transformational environment, team member
communication influences activities and the creative aspect of performance by eliciting trust among team members (Boies et al., 2015). Team member trust is a necessary pillar of the team’s foundation. All members feel free to share knowledge research and contribute to the attainment of project objectives (Boies et al., 2015). Trust among team members is positively related to task performance (Boies et al., 2015).

Customer Influence

Customer perception is exceptionally influential in determining project outcomes as a success or failure (Davis, 2016). Davis (2016) provided examples of each, such as the Sydney Opera House, which was considered a wondrous engineering feat and beloved by the public. Yet, the project was 15 times the original budget and over three times the original timeline. Contrary, London’s Heathrow Airport Terminal Five was deemed a failure by British Airways due to insignificant start-up issues, yet the project was completed within time, cost, and quality constraints.

Overall, success in IT projects is based on schedule, cost, and quality, but the customer view must also be considered (Mukerjee & Prasad, 2017). The customer view evaluates the project details at a micro level based on the impact on end-users (Mukerjee & Prasad, 2017). However, not all stakeholders emphasize the exact dimensions to determine project success (Davis, 2016). Davis (2014) concluded that the stakeholders’ perception of project success should equal key performance measures and actual results. As organizations continually seek to manage IT projects and leverage resources efficiently, the IT department must rapidly adapt and adjust to changing customer demands (Lowry & Wilson, 2016). Agile approaches benefit team performance and project outcomes by allowing teams the flexibility to address uncertain and
volatile requirements and encouraging shared understanding and continual feedback between the customer and the team members (Venkatesh et al., 2020).

**Influencing Theories**

This study included research that delved into the extant literature and personal interviews with IT professionals. Creswell (2014) suggested that data be categorized to flesh out the emergent themes. By incorporating data analysis, relevant details were coded to aid the researcher in discovering themes and patterns, which strengthened the understanding of the results. Bloomberg and Volpe (2012) supported this concept by stating that coding the data into relevant topics enables an increased and deeper understanding of the findings. While numerous theories were evident in the data, those identified during the academic literature review were noted in the following section.

**Project Management Theory**

**Agile Manifesto.** As software development teams began using Agile project management, other industries noticed the advantage of developing products and processes employing a continual and incremental approach (Hidalgo, 2019). The creation of the Agile Manifesto in 2001 was intended to define standards and fundamental philosophies for improving and finding new ways to develop software (Hohl et al., 2018). The 17 contributors to the Agile Manifesto each came with a software development technique that added context to the foundation of the document, including adaptive software development (ASD), extreme programming (XP), and feature-driven development (FDD; Hidalgo, 2019; Hohl et al., 2018). However, all the creators shared two common goals, reduce bureaucracy, and deliver value (Hohl et al., 2018). The manifesto has become ubiquitous with Agile practices. The general wording of the document led to its usage far beyond software development and project
management to include sales, management, and many complex multidisciplinary topics such as innovation and venture capitalism (Hidalgo, 2019). With the expansive increase in innovation and the digitalization of products and services, Agile methodologies are aiding organizations in keeping pace with technological advancements (Hohl et al., 2018).

The Agile Manifesto was written as a response to the disadvantages and inflexibility of traditional software development models, particularly to address the absence of openness to requirement fluidity (Hohl et al., 2018). This single document has inspired thousands of teams in companies around the globe to develop products, services, and processes in a manner that is responsive to customers’ needs and requirements, productive for the employing organization, and satisfying for the team members involved (Denning, 2015). It is this core set of values in the Manifesto aimed at enabling software development teams to perform well as a team that expanded this philosophy to a global phenomenon and groundbreaking management manuscript (Denning, 2015; Seymour & Hussein, 2014). The Agile Manifesto's guiding principles are:

1. Associates and their exchanges take precedence over procedures and tools
2. A working product or service is more important than exhaustive documentation
3. Customer teamwork is more important than contract discussions
4. The ability to adapt to requested change is valued over strict adherence to the project plan (Boehm, 2002; Cervone, 2011; Denning, 2015).

**Stakeholder Theory.** A basic concept within project management holds the idea that the likelihood of project success can be increased by influencing project stakeholders (Davis, 2014; Eskerod & Larsen, 2018). The more knowledge and understanding of the stakeholders the project management obtains, the easier and more effective it is to manage the stakeholders (Eskerod & Larsen, 2018). Eskerod and Larsen (2018) indicated that stakeholder behavior
demonstrates the actions taken toward the project by a group or persons capable of impacting or being impacted by the project result. Unfortunately, human behavior is not predictable, and it is difficult to anticipate project stakeholder actions (Eskerod & Larsen, 2018). The uncertainty inherent in this relationship between stakeholders and project management is a risk that burdens the project (Uribe et al., 2018). Therefore, stakeholder theory exists in this knowledge area and is fundamental in assessing project performance (Uribe et al., 2018). The influence of stakeholder theory on project risks can be detected in the analysis of systematized procedures used to assess the risks associated with stakeholder management and develop risk avoidance and mitigation strategies (Davis, 2017; Eskerod et al., 2015; Uribe et al., 2018).

Stakeholder management is a fundamental tool in leading a project (Eskerod et al., 2015). The ability of project management to successfully work with the stakeholders increases the organization’s strategic competence and ties project outputs to key business performance measures, fostering value for all involved (Davis, 2017; Uribe et al., 2018). The evolution of stakeholder and project integration aids in counteracting the complexity and uncertainty of the project and enables improved communication and collaboration to meet project objectives (Uribe et al., 2018).

Many organizations have adopted an Agile approach upon recognizing that byzantine hierarchical structures and drawn-out decision-making practices are no longer appropriate in an environment of complexity and rapid change (Franklin, 2014). Due to more considerable uncertainty in the global financial and economic sectors and the increased speed of technological advances, customer expectations of unique and specific solutions require a change in work processes and procedures (Franklin, 2014). The pace of change continues to evolve, resulting in shorter product lifespans demanding instantaneous payback and return on investment. Agile
methodologies are aptly suited for addressing change due to the emphasis on customer-centric solutions that evolve throughout the project (Franklin, 2014). Unlike traditional project methods, a vital element of an Agile approach is understanding that change cannot be planned in advance but rather emerges as an understanding of the business requirement (Franklin, 2014).

Kamal et al. (2020) stated that Agile activities are communication and collaboration-focused. The organization of the customer requirements in Agile projects is complicated due to the lack of extensive documentation, which is increased because requirement changes can be requested during any project iteration (Kamal et al., 2020). Changes to requirements occur because of the evolving customer, stakeholder, and organizational needs (Kamal et al., 2020). Agile development and requirements change management demand exceptional communication and collaboration (Khan et al., 2014). The complexity of managing requirement changes in collocated environments is challenging. In contrast, the complexity of this task increased substantially with distributed teams due to geographical distances, language, and cultural differences between team members (Khan et al., 2014).

Management Theory

There are several claims to the root of project management. One camp of theorists proposes that project management started in the 1940s in operations research (Turner, 2010). Other groups argue project management comprises organizational management theory, operations research, management science applications, and real-world business practices (Davis, 2016). The consensus is that project management is related to management disciplines and originates from classical management theory based predominately on Taylor’s scientific management, also referred to as Taylorism or the Classical Perspective (Davis, 2016). Many classical theorists, such as Fayol and Taylor, focused on organizational purpose and formal
structures, relying on hierarchies and formally defined roles and responsibilities to control time, cost, and quality (Fayol, 2013; Taylor et al., 2011). This type of management view expects processes to work linearly using standard or common tools, such as Gantt charts and work breakdown structures for all kinds of projects (Davis, 2016). Turner (2010), however, stated the opposing view that projects are unique and therefore require special management tools adapted for individual project elements. The difference in the contrasting views is that one focuses on the organization, and the other emphasizes associate participation and engagement (Davis, 2016).

**Network Management.** From a sociological standpoint, projects can be considered an arrangement of social groups with fairly established communication and collaboration patterns throughout the project (Zheng et al., 2016). As a result of this interaction, team members develop formal and informal connections. Zheng et al. (2016) suggested the management theory of network management addresses knowledge transfer, resource utilization, and consensus-building among project members. Project networks are sensitive to the subtleties and complexities of project environments, which require rapid response and change (Hu et al., 2015). Therefore, network management is fundamental in adopting a social perspective focused on the informal relationships between project members (Hu et al., 2015). The use of network management is applicable in identifying patterns of interaction in many areas of project management involving communication and collaboration, coordination, performance, and resource management (Zheng et al., 2016).

**Theory of Constraints.** TOC theory is based on optimizing the system and controlling the outcome (Goldratt, 2017). Focusing on the most crucial issues is the central tenant of TOC, resulting in non-critical issues or processes experiencing a vast amount of autonomy (Trojanowska & Dostatni, 2017). Most attention is given to critical tasks to ensure the
achievement of project objectives. Constraints are the principal barriers to realizing the project goals (Goldratt, 2017). Whatever prevents the accomplishment of these goals is considered a constraint. The identification of constraints is a source for project improvement (Izmailov et al., 2016; Šubrt, 2012). Critical chain project management (CCPM), as defined by Goldratt (2017), falls within the TOC umbrella and is focused on eliminating unproductive behaviors that threaten the achievement of project objectives. The critical path can be identified by defining the relationship and required time constraints between resources and tasks (Izmailov et al., 2016; Šubrt, 2012). Trojanowska and Dostatni (2017) found that CCPM aids in systematizing the project and improves communication and collaboration with team members. Additionally, CCPM helps streamline and reduce documentation, enhances the timeliness of schedule adherence, and increases project quality (Goldratt, 2017; Trojanowska & Dostatni, 2017). Further facilitating Agile processes, CCPM aids in changing employee habits and overcoming resistance to change (Trojanowska & Dostatni, 2017).

**Control Theory**

IT projects are complex and dynamic, comprised of ambiguity and uncertainty (Wiener et al., 2016). Control theory is a primary management tool frequently used in challenging projects (Remus et al., 2020). The authors indicated the need for control styles due to the many issues impacting the project outcome (Remus et al., 2020). Essentially, the relationships and interactions between and among team members and stakeholders can be rife with internal politics and conflict, impacting motivation and the project result (Wiener et al., 2016). Control is split into two contrasting styles, formal or authoritative and informal or enabling (Remus et al., 2020). Venkatesh et al. (2018) found that the use of controls directly impacts task performance and,
depending upon the style, can lead to adverse socio-emotional side effects such as demotivation and dissatisfaction, resulting in decreased overall project performance.

**Formal Control.** Formal control methods depend upon a structure that influences associate behavior using performance evaluation and rewards (Beck & Schott, 2012; Remus et al., 2020). Resource allocation decisions and the selection and training of project members are a type of formal control. Formal control is also used to influence processes and behavior. Reinforcing associate behavior controls the performance outcome by analyzing actual results with the desired ones (Wiener et al., 2016). This type of authoritative control is designed to compel conforming behavior based on goal attainment (Heumann et al., 2015). Using this approach leaves team members with little to no leeway for input instead of relying on bureaucratic values and a rigid top-down structure (Remus et al., 2020).

**Informal Control.** Informal control, also known as social control, practices the use of social and personnel policies to decrease goal diversity between the project leader and the team members (Beck & Schott, 2012; Remus et al., 2020). Several informal control modes are appropriate in Agile environments. The reinforcement of acceptable behavior defines clan control through collective experiences, practices, and meetings. Similarly, self-control is behavior and goal achievement measures established by the team member (Wiener et al., 2016). These informal control modes are associate-driven, enabling and requiring self-management and flexibility in addressing project tasks. Additionally, Beck and Schott (2012) described informal controls as valuable in negotiating and merging team members' contrasting norms and values to aid in team cohesiveness.
Summary of Literature Review

The management of projects has existed for centuries. As processes and technology improved, project management became a management field as an extension of the management sciences. All projects are defined as temporary and unique endeavors. There is no one definitive approach to project management. There are numerous traditional and Agile approaches to project management, and selecting the correct method depends on multiple factors. However, in the current dynamic environment of rapid technological advancement and innovation, organizations require flexibility and cognizance of uncertainty.

IT projects are particularly susceptible to changing requirements due to increased complexity and multi-dimensional customer requirements. As a response to the need for adaptability and acceptance of requirement fluidity, Agile practices and methodologies were developed, ultimately resulting in the creation of the Agile Manifesto. The benefits of using an Agile framework include improved motivation and team member satisfaction, increased control of customer requirements, higher-quality delivery, and added value to the organization. Notwithstanding, there are impediments to effectively implementing and practicing an Agile methodology. Relatively small, self-organized and collocated teams form the foundation of Agile project management. The most common and severe barrier to using an Agile approach is that organizations resist the changes needed to remove hierarchal structures and comfortably assimilate to an ambiguous and uncertain environment.

Due to the current socio-economic global environment, organizations are looking to reduce costs and deliver expediently to the market. These trends have led to increased use of off-shore resources resulting in distributed Agile teams. A global disbursed team offers multidisciplinary and independent members while also recruiting the most talented resources.
However, for the Scrum Master, close coordination, heightened communication, and collaboration are difficult to foster and manage with remote team members.

The literature review explored topics that impact how projects are managed, specifically those using an Agile approach with distributed team members. The Scrum Master has to remove obstacles and barriers that prevent the team from successfully addressing and completing user stories throughout each sprint. The case study explored the interaction between the Scrum Master and remote team members to ascertain the impact on member productivity.

**Transition and Summary of Section 1**

The foundation of the study in Section 1 defined the problem and helped structure the research questions based on the identified problem. Understanding the issues in Scrum Master engagement requires advanced leadership and management expertise along with incentives to foster communication and collaboration with remote team members. The literature review furnished an overview of the professional and academic articles that exist on this topic of project management, including evaluation of Scrum Master roles, influencing leadership, management theory, and current trends and pitfalls in utilizing distributed teams. The next section of the study provides additional detail on data specifics, such as what data were collected and how it was attained, along with the methods and tools used to analyze it and identify themes. Lastly, the following section will offer a summarization of the results as well as recommendations for future research.
Section 2: The Project

Section 2 of this dissertation focuses on the research aspect of the project. Based on the selected research method and design, the roles of the stakeholders were determined. The responsibilities of the researcher and the participants were defined, including the number and type of participants. This section of the study determined and discussed an overview of the research design, data instruments and collection methods, and data analysis tools and procedures. The data collection process, including instrument specifications, provided a picture of the data collection and the utilized organizational techniques. The approach used for data analysis and the strategy for maintaining reliability and validity in the case study provided the structure and accuracy of the results collected.

Purpose Statement

The purpose of this qualitative case study was to expand and develop the project management body of knowledge by delving deeper into the understanding of how the inability of the Agile Scrum Master to interact with and lead globally distributed team members impacts productivity. In addition to adequately managing cost and time constraints within adaptive process projects such as Agile (Project Management Institute, 2017b), presenting insight to relevant scum master characteristics and skills will add value for the customer and product owners. Program management and product owners can use this information to evaluate scum masters. Scum masters can use the acquired knowledge to hone their servant leadership skills further and facilitate team participation and collaboration. This problem is explored through an in-depth case study of Scrum Master engagement with distributed team members and the impact on productivity in information technology projects undertaken by a German manufacturer.
Role of the Researcher

The researcher in this case study was an experienced team member and project manager with over 22 years of experience working for the organization under investigation. Due to the researcher's years of experience and relationship with the organization, extreme caution was undertaken to minimize bias and capture objective data during participant interviews. The key responsibilities of the researcher are investigating, collecting, and interpreting the data (Creswell, 2014). Qualitative research is exploratory, and in cases where the researcher is associated with the organization and study participants, due diligence must be exercised to minimize bias and warrant data validity (Creswell, 2014).

Bias is an action or behavior that precludes impartial contemplation of a subject (Pannucci & Wilkins, 2010). Bias can occur at various stages of a research study, from design, population or sample selection, data collection, and data analysis (Pannucci & Wilkins, 2010). Defining or interpreting the presence of bias is not a simple yes or no answer, but the degree to which a reviewer or reader of the literature considers bias was prevented at the various design and execution stages and how it might impact study results (Pannucci & Wilkins, 2010). In an effort to reduce bias during the study phases, the researcher will apply minimization techniques from both the researcher and participant perspectives. The study is well-designed, explicitly detailing data collection and analysis methods, and bias will be reduced with standardized protocols and procedures throughout the process.

Furthermore, the researcher used volunteer participants, blind data collection, engagement of the participants in reviewing the results, and triangulation of multiple data sources to support the interpretation of the results (Smith & Noble, 2014). Yin (2009) stated that the interviewer requires the necessary skills and talent to evoke insightful responses from the
participant interviews in a case study. Furthermore, the researcher must define thoughtful and open-ended interview questions to prompt the study participants' thoughts, feelings, and explanations (Yin, 2009). The characteristics of open-ended research questions and applicable interview techniques include an in-depth exploration of the topic, comprehension of the underlying processes, collection of the most important ideas and themes, and the potential to highlight correlations (Weller et al., 2018). Although other scholars might understand the data in a different way, realizing and comprehending how the themes were established plays a crucial role in presenting the vigor of the results (Smith & Noble, 2014).

The process of gathering the case data began with organizational approval to conduct the study. The researcher submitted a formalized request to the project management office asking for permission to interview distributed team members and scrum masters with responsibility for those remote members. Once the organization approved, the researcher contacted possible participants and asked them to take part in the study, and provided each associate with a formal participant request. This form described the study and invited each associate to participate in an interview to discuss perspectives on remote team engagement by the scrum master and what characteristics and skills hinder and help them when interacting with distributed members. The researcher scheduled and conducted all the interviews. Additionally, with the permission of the study participant, the sessions were audio-recorded to capture exact phrasing, tone, and emphasis so that the researcher was prepared to obtain all relevant content and themes that emerged.

While conducting the interviews, unrestricted and indeterminate questions were used to gather information about the skills, abilities, and characteristics of the participating scrum masters relating to remote team members. Additionally, the interview questions were constructed to associate elements of management, leadership, and project management theories to acquire
themes and narratives that develop from the data. All participant responses were transcribed and coded using anonymous acronyms to analyze and detect developing themes and topics. Once the interviews were complete, the researcher categorized and evaluated the coded data to identify themes. The researcher entered all data into the NVivo application to aid in grouping and interpreting the data.

**Participants**

This study was conducted in a large multi-national corporation to study the engagement practices of agile scrum masters with remotely located team members. A primary task of the researcher was to identify a cross-section of organizational scrum masters and agile team members to participate in the study. The study included participants from Agile IT projects conducted within the global organization. The sample size was reasonably small to aid the depth of examination essential to this type of inquiry yet large enough to capture detailed description and understanding (Vasileiou et al., 2018). Potential candidates had to meet several requirements for consideration, including knowledge of agile project methodologies, experience in at least one agile project with remote team members, the ability to express their thoughts in the English language, and willingness and time to participate in the study.

During the execution of qualitative studies, it was vital to guard against ethics violations. Stake (2010) documented the necessity to adhere to uniform and robust review procedures when conducting research involving human participants. It is the researcher's responsibility to protect the privacy and rights of human subjects (Stake, 2010). The importance attributed to research ethics and participant privacy was further supported by the Institutional Review Board (IRB). The IRB required the organization's approval to contact associates in the solicitation for the study and approval from each participant. Social projects such as qualitative case studies must be
mindful of the mental impact on human participants. As Stake (2010) mentioned, it is important to learn how things work, but it should not be done at the expense of the emotional cost of the participants. Anonymity does not sufficiently replace privacy protection (Stake, 2010); intensely personal information should be avoided unless highly relevant to the study (Brayda & Boyce, 2014; Dempsey et al., 2016). For purposes of this case study and to meet the Liberty University IRB process requirements, all participants were required to provide written consent for their participation, including comprehension of the privacy protection process utilized during the data collection phase.

**Research Method and Design**

Research provides the vehicle for inquiry and study to understand how something works fully (Stake, 2010). Stake (2010) stated that all scientific work is a blend of qualitative and quantitative thinking. From the three dominant research methods, mixed-method, qualitative, and quantitative, a qualitative methodology was selected for this research study. Wohlin and Aurum (2015) stated that given the numerous approaches to qualitative research, it is difficult, although imperative, that researchers place considerable thought in selecting a research methodology. Wohlin and Aurum (2015) further indicated that qualitative research, which relies on empirical evidence, is not based on beliefs or opinions but on informed and well-rounded decisions when selecting the research method. Choosing the appropriate research method is critical to the study and impacts the research design (Abutabenjeh & Jaradat, 2018) as well as aiding in the development of the research questions (Wohlin & Aurum, 2015).

Regardless of level, institution, or scientific effort, the design of the research proposal is a fundamental building block for all studies (Schwartz-Shea & Yanow, 2013). Research design is centered on making appropriate choices and providing explanations for those selections, thereby
aiding in structuring the research plan (Abutabenjeh & Jaradat, 2018). During the design phase of the study, questions essential to the participants, settings, and language are answered, and the researcher specifies how these topics are connected.

**Discussion of Method**

Köhler et al. (2018) stated that the variety of qualitative approaches is a primary strength of this research method allowing for a plethora of data and materials that can be used to convey a message, such as photographs, audio clips, or objects, how the data are evaluated, and how the information is regarded and coded. Specifically, qualitative approaches are adaptable, allowing the researcher flexibility in formulating research questions, sampling decisions, and data collection options (Denzin & Lincoln, 2018). Qualitative research offers formidable approaches that allow the researcher to adapt the design method to the data.

A qualitative method was selected for this study to extract the perception and understanding of a scrum master's engagement with remote team members. Qualitative inquiry is frequently used to explore social issues through lived events and informal practices (Creswell, 2014; Hood, 2015). The gathering of personal-based data was accomplished with open-ended interview questions so participants could share interactions with the Scrum Master and other remote team members. This approach has the potential to aid in profound discovery and foster genuine results (Yin, 2018). Open-ended questions will be utilized in the participant interviews. This technique allows for discussion and explanation of the situation through the lens of the individual team members and Scrum Masters, relating personal experiences and allowing flexibility in their storytelling techniques. Cunningham et al. (2017) stated that interviews enable study participants to tell a story and offer their perception of the situation. While it is important for study participants to provide full disclosure, conducting qualitative research requires talent
and understanding to gain the trust of study members as they share personal or private information (Brayda & Boyce, 2014). Researchers must be conscious of ethical obstacles that can arise during qualitative discussions that lead to participant unease or discomfort (Dempsey et al., 2016). A qualitative researcher must employ active listening, trust-building, empathy, and patience (Brayda & Boyce, 2014).

**Discussion of Design**

Abutabenjeh and Jaradat (2018) suggested that the study’s design is the pattern used to guide the planning process by detailing how the study will progress from research questions to results. Proper planning of the study organizes the data collection and analysis intended to increase understanding (Abutabenjeh & Jaradat, 2018). Furthermore, case study methods enable in-depth analysis and the opportunity to understand the context of the situation in relation to the specific environment, such as the Agile projects conducted by the global manufacturer in this study (Cunningham et al., 2017).

A qualitative approach using a case study design was selected for this research study. Yin (2018) indicated that a case study aids in capturing the intricate details of real-life cases. This design was chosen to give participants the ability to express their experiences and influence the problem resolution, which aids in developing rich and valuable content to the study data (Chandler et al., 2015; Yin, 2018). Interviewing remote team members and scrum masters allowed the researcher to gather data directly from project members, understand professional viewpoints, and develop pragmatic results. The interview transcripts were coded and analyzed to uncover themes and patterns, promoting an increased awareness of the research problem. Furthermore, a case study design encourages the expansion of knowledge directly from the study members that can influence problem resolution.
A case is a distinct research object selected because of a specific goal under germane circumstances, such as understanding how the engagement of scrum masters with remote team members impacts team productivity (Zembik, 2016). Due to exploring a unique, site-sensitive problem, generalizations across broad populations are not expected (Zembik, 2016). While the universal application of the results is not appropriate for this study involving participants with different cultural orientations, physical locations, and experiences can offer more robust results and apply to similar organizations with global Agile teams (Bickman & Rog, 2013).

**Population and Sampling**

In a perfect world, the entire population of the global manufacturer's scrum masters and remote team members would be considered. However, this approach is not realistic nor necessary to reach data saturation. Researchers typically take a population sampling to generalize results within the total population. This study's population was taken from the target organization's scrum masters and remote team members to acquire various experiences and views related to scrum master engagement and the resulting impact on productivity. A suitable sample size was retained to ensure the study results were meaningful for this population. Padgett (2012) stated that the sampling decision must be driven by the research questions and intended goals, focusing on selecting participants that can provide the required information. Furthermore, qualitative sampling supports academic and speculative reasons and is not intended to represent the population in general (Padgett, 2012). The following sections discuss the population size, sampling procedure, sampling size, sampling framework, contributor eligibility conditions, and the designated sample's significant characteristics.
Discussion of Population

Data regarding the engagement practices of scrum masters with geographically remote team members were collected by interviewing Agile teams located in North America. Most Agile Scrum Masters with remote team members in this multi-national enterprise were located in Europe due to the central organization of the project management office and information technology departments. However, due to human resource constraints and global data protection laws, only Scrum Masters residing in North America were eligible to participate in the study. The selected population was defined as scrum masters that work a minimum of 50% of their working hours as scrum masters, speak the English language, and have geographically distributed team members. The remote team member population was defined as agile team members who physically reside in North America and speak English.

The population from which study participants are obtained should be chosen concerning the study (Enarson et al., 2004). A cross-section of scrum masters with varying levels of experience and education in Agile methods and remote team members from the target organization was included in the study to establish a diversity of participants related to the experience level and the different participant's perspective groups.

Discussion of Sample

Defining the appropriate sample size is required to detect themes and statements that lend an understanding of the research problem (Creswell & Poth, 2018). The sample size should seek to produce a study population characteristic of the target population, sufficient in size to reduce the influence of random variation, and satisfactorily epitomize all population sub-sections of interest (Enarson et al., 2004). The sample size should generally reflect the amount of data and analysis to the point that no new stories, themes, or concepts emerge, thus achieving theoretical
saturation (Van Rijnsoever, 2017). Van Rijnsoever (2017) indicated that most qualitative researchers do not use probability sampling to determine the saturation sample but instead rely on selecting information-rich cases that illustrate the research questions. Nevertheless, determining the sample size needed to reach saturation is challenging to approximate. Several researchers, including Malterud et al. (2016), Marshall et al. (2013), Mason (2010), and Van Rijnsoever (2017), concluded that the minimum sample size of qualitative studies lies well below 50. Populations that display similarity require smaller sample sizes and may reach saturation with as few as twelve or fewer samples (Malterud et al., 2016; Roland, 2016). The likelihood of detecting relevant codes is more essential than the number of codes within the population to achieve theoretical saturation (Van Rijnsoever, 2017).

The various approaches to qualitative research have different sampling requirements. Padgett (2012) stated that case studies typically have small sample sizes. The smaller the sample size, the more depth is required for data collection; likewise, smaller sample sizes can be utilized in cases of homogeneous groups (Padgett, 2012; Roland, 2016). Finally, due to the flexibility intrinsic to qualitative sampling, the study may end with fewer participants if saturation is reached early (Padgett, 2012). Additionally, Guetterman (2015) stated that in qualitative studies, the research questions are limited to investigating the occurring event and, therefore, the sampling process is iterative by nature to reach appropriate saturation.

The participants comprised seven Agile Scrum Masters and four remote team members. If saturation had not been reached, additional participants would have been added until no new themes or codes emerged, or the researcher determined additional interviews would be unlikely to add new insight. Purposely selecting participants allowed the researcher to comprehend their varying perceptions and answers to the related interview questions (Creswell, 2014). The
researcher used selective sampling for this study based on Agile project members, experience, and training levels. The researcher reviewed the collected data for depth and richness during the interviews to determine the saturation point.

**Data Collection**

Unlike quantitative research, which occurs in a specialized setting such as a clinic or laboratory, qualitative research occurs globally. In a qualitative study, data collection gathers or creates verbal and visual information to analyze and comprehend a social situation (Denzin & Lincoln, 2018). As previously discussed, a qualitative research method aims to understand or describe a social issue by analyzing the experiences of involved individuals or groups. Experiences can encompass life narratives, knowledge, memories, or stories. The researcher, based on observation, interaction, or communication, analyzes these experiences along with supporting documents such as letters, texts, or photographs seeking to understand how people construe the space around them, what activities they participate in, how they are engaged in those activities, or what they are encountering in descriptions that are expressive and insightful (Brayda & Boyce, 2014; Denzin & Lincoln, 2018; Hewitt, 2007). These various approaches allow the researcher to develop generalized techniques, classifications, or theories to depict or clarify a social issue (Flick, 2018).

Flick (2018) indicated that a fundamental goal of collecting data in a qualitative study is to present data that afford the possibility for empirical analysis of the situation under study, encompassed by a methodological approach for collecting data suitable for understanding the problem. The second point of qualitative data collection concerns how the data are collected. Although data collection tactics are dependent on the study's methodological approach, the
researcher must account for the relevance of the techniques and methods used as a tenet for selecting data collection practices and how they are applied (Flick, 2018).

The researcher collected data via individual interviews within the target organization. Hewitt (2007) suggested that interviews provide realistic insight into actual experiences. However, ethical suspicions concerning the researcher and the researched connection remain unavoidable. Nevertheless, to understand and interpret reality, the researcher’s subjectivities are central to the research process, and objectivity is not required or desirable (Brisola & Cury, 2016; Hewitt, 2007). All interview responses from the study participants were recorded to protect the confidentiality of the information.

Furthermore, from study design to data collection, ethically grounded research should guarantee the participants’ protection and rights (Hewitt, 2007). The researcher’s responsibility is to be conscious of the participant's needs and accounts for them ahead of research necessities (Aluwihare-Samaranayake, 2012). Finally, the researcher categorized and consolidated the data to codify the data to extract themes and patterns.

**Instruments**

In qualitative research, the researcher is the instrument (Patton, 2015; Stewart, 2010). Yin (2018) indicated that the researcher needs to be flexible during the data collection process. Furthermore, the researcher requires self-awareness and ownership of their perspective while conducting the study and interacting with participants (Patton, 2015). Conducting qualitative inquiry research demands the researcher to address self-evident social identities by comprehending the researched topic, the study participants, and the criterion establishing creditable research (Jones et al., 2014). Qualitative researchers are the research instrument and
must continually adapt and develop that role to allow partnering with participants to create knowledge (Xu & Storr, 2012).

This qualitative case study used personal interviews to capture data and themes to decipher engagement practices, styles, and characteristics of interactions between Agile scrum masters and distributed team members. Data were gathered on scrum master education, management skills, soft skills, and leadership styles. Additional themes developed during the interviews depended on the participant's responses and the researcher's ability to respond to questioning appropriately. The researcher listened to participant responses actively and used spontaneous interaction to guide the interview (Aluwihare-Samaranayake, 2012). The subjects presented in the literature review served as the basis for theme development supported by the researcher's knowledge and experience in the related areas. Yin (2018) indicated that the researcher relies on topic knowledge to further insight and understand collected data as an active participant.

**Data Collection Techniques**

Various data collection techniques are available in qualitative research, including observation, pictorial, written, and interviews, with interviews being the most common method (Gill et al., 2018). While interviewing can be fairly time-consuming, it is appropriate for this case study to gain deep insight and understand the involved participants (Creswell & Poth, 2018). Patton (2015) indicated that successful interviews delve into non-visible cues such as opinions, beliefs, viewpoints, and intentions. A significant premise behind qualitative interviewing is that others' perspective is meaningful (Brayda & Boyce, 2014).

Semi-structured interview questions were defined to highlight the topics explored and allowed the participants to diverge from the subject to pursue an idea or reply in detail, allowing
for additional discovery or explanation of key points (Gill et al., 2018). Well-formatted questions can provide a framework for understanding the phenomenon under study, preliminary to theory development (Silverman, 2014). Silverman (2014) suggested that the researcher be cognizant of participant body language, maintain eye contact, and actively engage in making connections between past points and current discussions. Lastly, Patton (2015) stated that interviewing inter-culturally presents additional challenges relevant to the topic under study.

Due to COVID-19 travel restrictions, all interviews were conducted via Microsoft Team Meeting. Handwritten field notes and recordings of the meetings comprised the data collection methodology. The researcher transcribed the audio recordings. The power to document the participants' words verbatim increases data integrity as it can be repeated as necessary to capture precise points of the interviewee's reflections and experiences (Chandler et al., 2015). All notes, recordings, and transcriptions were maintained on the researcher's laptop computer. An electronic database was used to code and analyze the data.

The researcher in this study created a list of preliminary questions to promote interview consistency across participants and their respective project roles. These questions were maintained in the interview manual (see Appendix A for Scrum Masters and Appendix B for distributed team members). Additionally, follow-up questions were designed to help the researcher guide the conversation to capture deep and meaningful reactions and replies. Collecting various aspects of the participants' answers, such as body language, viewpoints, and tone, allows the researcher to compile and synthesize the data to foster theme emergence (Creswell, 2014). Using a semi-structured approach permits flexibility in the researcher's approach to questioning lines based on participant responses, enabling the pursuit of incomplete or unclear discussions. Furthermore, the adaptability inherent in allowing follow-up questions
aids in facilitating communication. Priyadarshini (2020) indicated that a qualitative researcher must develop the skills appropriate to function as the human instrument, including the awareness to detect nuances in the data, having the insight and aptitude to give meaning to the data, and the capability to recognize and separate pertinent data from that which is not.

**Data Organization Techniques**

During the interview, data were collected by handwritten notes, and these notes were transcribed into Microsoft Word using handwritten notes and visual/audio recordings. Since the researcher could not travel to conduct the interviews, each participant was asked to agree to record the interview session in Microsoft Teams. Chandler et al. (2015) discussed the audio and visual recording of the interviews assist the analytical process by enabling verbatim transcription of the verbal and nonverbal content to maintain the integrity of the data. The researcher transcribed all recordings to capture as much detail as possible. Respecting the participants' genuine meanings and words enhances the opportunity to detect the subtleties allotted to demeanor, terms, and body language, allowing the researcher to record personal observations and perceptions of the interviews (Chandler et al., 2015). All recorded data were stored on the researcher's laptop and, to maintain anonymity, were not disseminated in the research findings. All data were input into the qualitative data analysis software, NVivo, to help organize, analyze, and reveal insights into the unstructured interview data.

**Data Analysis Techniques**

Data analysis for this study was an iterative process, starting with a thorough review of the extant literature to recognize emerging themes and patterns from the interviews conducted. The literature's qualitative assessment helped the researcher envision possible discussion points and responses to the related research questions. Additionally, an exhaustive review of the
literature was undertaken to derive support for the themes developed during data analysis. Answers to the research questions will originate from the data collected during the interviews. Productive data analysis requires the researcher to be intimate with the collected data, receptive, and flexible to emerging insights, maximizing interaction with the data using various learning modes to ensure the analysis process is rigorous and productive (Maher et al., 2018). While coding, a qualitative researcher categorizes and splits the data into logical groups and sections (Bloomberg & Volpe, 2019). When analyzing data, the qualitative researcher attempts to decipher and construe an understanding of the participants’ social situation (Bloomberg & Volpe, 2019). Ponelis (2015) indicated a plethora of analysis methods such as content analysis, constant comparison, and pattern matching and that no matter the selected approach, the researcher should be transparent as possible to encourage theory development and current knowledge and understanding. Lastly, the researcher must synthesize the various aspects of coded data, weaving the data back together to increase awareness of how the interview results support identified themes and findings (Bloomberg & Volpe, 2019).

**Coding Process**

Maher et al. (2018) stated that coding is a standard data analysis method in qualitative research. During coding, the researcher systematically reviews the collected data, splitting similar points into groups with unique identifiers, enabling the classification and organization of the data (Creswell, 2014; Maher et al., 2018). The iterative process of data collection, analysis, and theory is a constant comparison and refinement of the data (Rogers, 2018). The investigation leads to the reexamination of the data collection, deliberately advancing toward theory emergence (Ponelis, 2015; Rogers, 2018). Additionally, the researcher is pivotal to interpretative research as an active participant and a creative element (Alam, 2020).
Data coding is the transition from data collection to data analysis (Saldaña, 2016). NVivo is deemed one of the most robust computer-aided qualitative data analysis software applications available (Feng & Behar-Horenstein, 2019). It supports the researcher in coding and analyzing open-ended responses to interview questions and other data like introspective writing, correspondence, and videos (Feng & Behar-Horenstein, 2019). NVivo software was used to categorize, tag, and manage the data in this study. The interview transcripts were reviewed to parcel the content into codes based on recurrent wording, interactions, and cases. The researcher will then identify themes that comprise two or more codes, associating the themes with supporting texts (Saldaña, 2016). Lastly, the sub-categories will be reconciled for final analysis and result presentation. (Feng & Behar-Horenstein, 2019).

Computer software programs can detect and analyze data by dividing it into categories, creating codes to tag the data, and further refining it to find six to eight emergent themes that answer the research questions (Rossman & Rallis, 2011). Captured data should be restricted to 20 or fewer groups, coded by theme, and the codes should then be reduced to five to seven rich themes (Rossman & Rallis, 2011). As data were collected, the researcher coded anticipated themes associated with leadership, management, and project management theories and determined if other themes or trends appeared. Finally, NVivo provides a structured format for data storage with tools that facilitate data analysis and management (Feng & Behar-Horenstein, 2019). The themes identified by linking the collected data were reviewed to determine whether the themes provided answers to the research questions related to uncovering characteristics and skills that lead to the successful engagement of remote Agile team members (Ponelis, 2015).
Reliability and Validity

Creswell and Poth (2018) suggested that a qualitative scholar's research must be authenticated with extensive fieldwork, the inclusion of various types of data, hearty discussion, and in-depth analysis to persuade the audience's acceptance of the study results. In qualitative terms, reliability is the data adequacy concept, implying consistent analysis across the participant pool (Spiers et al., 2018). The other supporting arm of qualitative research is validity, which refers to data appropriateness, providing an accurate account of participant experiences and encounters (Spiers et al., 2018).

Reliability

Reliability denotes the research's thoroughness, specifically concerning the selected research method and how that method was managed and executed during the study (Rose & Johnson, 2020). Rose and Johnson (2020) further indicated that a clear justification of the research method, including a description of the analytical techniques employed, augments the research's reliability. Reliability focuses on the dependability and precision adhered to during the research phase, thereby increasing the likelihood that other researchers could comprehend the study and make use of the research method as communicated (Creswell & Poth, 2018).

In qualitative research, reliability can be achieved through meticulous note-taking and audio documentation of each interview (Creswell & Poth, 2018). Furthermore, reliability implies the research method is consistent among different researchers and studies (Creswell, 2014; Miles et al., 2020). Improved reliability can be achieved via consistency, rigor, and standardized structure (Rose & Johnson, 2020). Flick (2018) suggested increasing reliability by reviewing recordings and transcripts to identify possible errors. Yin (2012) also noted that the methodological approach, study protocols, and the research database should be thoroughly
documented to enable future studies to follow similar techniques. Lastly, it is important that the themes and codes that emerge during the analysis stage be clearly defined so that meanings are clear, enhancing the study's reliability (Miles et al., 2020; Saldaña, 2016).

For this study's purpose, the researcher verbally read each interview question to the participants to foster consistency across the sessions and reduce the discrepancy across participant responses. Furthermore, the interviews were transcribed verbatim, and a copy was furnished to each participant. All study participants were afforded the opportunity to review their specific transcripts before the data analysis phase. Additional methods of accomplishing reliability were to ask all participants the same questions and state the role of each participant and the researcher clearly. Creswell (2014) observed that reliability is created by utilizing a consistent process throughout the data collection phase. To maintain continuity between interviews, the researcher prepared an interview guide as a common starting point for each interview session and followed a semi-structured script with defined follow-up questions should the researcher need to delve deeper into the topic to stimulate discussion and obtain rich content and details. Hoorani et al. (2019) and Lock and Seele (2018) stated that consistency is a key step in qualitative research, specifically case studies, where using a stable base of questions that represent the research questions will add reliability to the data collected and the study's overall findings.

**Validity**

In qualitative research, validity indicates that the results have been checked for accuracy based on the researcher's viewpoints, the study participants, or the consumers of the research (Rose & Johnson, 2020). Validity is derived from pragmatic models such as universal principles, objectivity, and truth, thus indicating the study is relevant, meaningful, and well-grounded
Validity is not a singular concept that can be described by a simple definition, but rather a derivative of the research approach's processes and intentions; furthermore, the research must be legitimate and accurate (Cypress, 2017).

To foster accuracy and objectivity, the researcher selected a minimum sample size of 30 participants from the target organization. At least 15 Scrum Masters and 15 remote team members were interviewed until additional responses did not shed light on new themes or perceptions. By reaching the saturation point, there was depth and detail in the data based on the study participants' insights and experiences. Additionally, by including interviews from various departments and functional areas across the organization, the data were triangulated, promoting result validity.

Validity was tackled from both angles, internal and external. Internal validity was addressed by urging participants to validate their interview by reviewing the transcript. Member checking strengthens study validity by allowing participant review and the opportunity to indicate corrections (Creswell & Poth, 2018; Knowles, 2018). External validity is reached via data saturation, which will become apparent as responses are repeated during the interviews (Creswell & Poth, 2018). Furthermore, Creswell and Poth (2018) indicated triangulation could be achieved with analysis and convergence of the participants' divergent viewpoints, ultimately supporting and revealing emergent themes' accuracy. As Stake (2010) noted, the assessment of multiple perspectives leads to data validation.

**Transition and Summary of Section 2**

In this study, qualitative research was used to acquire an understanding of the research problem by conducting interviews with select participants of Agile projects. The use of semi-structured questions allowed for rich communication and in-depth discussion to gather a detailed
understanding of participant experiences and interactions. By following a consistent process with participants across multiple functional areas and varying education and experience levels, reliable and valid results were attainable. Upon receiving approval from the IRB and the school of business administration's dissertation committee, the researcher sought approval from the target organization to contact participants and schedule interviews.

While Section 1 focused on describing the research problem by developing a problem statement and research questions and producing a detailed literature review, Section 2 outlined how the study was conducted. The roles of the researcher and the participants were defined, and the research method and design were reviewed. Additionally, the population was identified, including the sample size, instrument, and collection techniques. Finally, the reliability and validity of the study were discussed, justifying instrument selection. Section 1 and 2 laid the groundwork for the study. The third and final section will detail the study's execution, including the data analysis results.
Section 3: Application to Professional Practice and Implications for Change

Project management has reached a level of prominence in various industries across the globe. The current darling of project methodologies, Agile project management, was adapted from extreme programming techniques and easily adjusted to changing customer requirements. Agile project management can increase productivity and support innovation and digitalization by enabling product and service customization and highlighting project management's human aspect. The ability to concentrate on short-term deliverables can promote team creativity and team productivity. A review of interviews conducted with Scrum Masters and remote team members identified characteristics and skills that aid in sprint success, team cohesiveness, and productivity. Interested organizations and leadership teams can use the information from this study to focus on training, selection, and promotion of Agile team members, specifically from the Scrum Master perspective. Furthermore, the outcomes can aid in the definition and development of role criteria resulting in an improved potential for success in the role of Scrum Master.

An overview of the study and a presentation of the findings is provided in this section. A review of the data collected and its relation to the emergent patterns and themes during data analysis will be discussed. Additionally, the application of the results to business and academic practice and suggestions for change was presented. Lastly, the researcher provides a list of recommendations for the continuing study and concludes with a final summarization.

Overview of the Study

Based on the researcher's personal work experiences and a thorough review of the extant literature, there is a need for an increased understanding of the skills, characteristics, and behaviors of Scrum Masters who interact successfully with remote team members. The purpose
of this case study was to determine and understand Scrum Master traits that support distributed team members in completing user stories. This qualitative research case study explored and documented the perceptions, observations, experiences, and thoughts of sprint success and Scrum Master behavior among several experienced Scrum Masters and remote team members. As Creswell (2014) stated, a qualitative analysis aids in understanding and defining a problem through the statements and observations of the individuals under study.

The project received support from the legal, compliance, communication, and human resource departments. Before the study could be conducted, a permission letter was sent to the human resource department at the target organization asking for approval to contact associates deemed likely to meet the inclusion criteria. The researcher was then required to contact and seek consent from the managers of those associates the researcher wished to recruit. Following each manager's agreement, a recruitment email and the organizational and management consent letters were sent to potential candidates that met the inclusion criteria. Lastly, each associate that agreed to participate signed a consent form to be interviewed and audio recorded. During the study, no participants were disqualified or opted to leave the study prematurely.

Typical in case study design, the data collection was time-bound (Yin, 2018), with interviews occurring from March through June 2021. Twenty to 35 participants were anticipated; however, the protocol indicated the final number would be determined by the point of saturation and could vary either way, higher or lower. The researcher determined that data saturation was reached after the seventh Scrum Master interview and the fourth remote team member interview and concluded data collection at that point. Figure 4 exhibits the researcher's iterative process for data collection, coding, and data saturation review.
The researcher interviewed 11 associates of a multi-national manufacturer utilizing Agile Scrum teams as a predominant project delivery method. The 19 question interview instruments in Appendix A and B aided in the structured and consistent examination and inquiry during the sessions. The study attempted to address specific questions about Scrum Master interaction and behavior towards geographically distributed team members. The research questions for this study are:

**RQ1.** Why do Scrum Masters fail to engage regional team members in daily stand-up meetings and sprint planning meetings?

**RQ2.** What are regional team members' perceptions of the Scrum Master's engagement during the daily stand-up and sprint planning meetings?

**RQ2a.** What Scrum Master behaviors and actions are perceived as helpful?

**RQ2b.** What Scrum Master behaviors and actions are perceived as unsupportive?
RQ3. In what ways does the Scrum Master describe experiences, interactions, and expectations of the remote team members?

Table 2

<table>
<thead>
<tr>
<th>Alias</th>
<th>Position</th>
<th>Date</th>
<th>Interview Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCM1</td>
<td>Scrum Master</td>
<td>March 27, 2021</td>
<td>36:24</td>
</tr>
<tr>
<td>SCM2</td>
<td>Scrum Master</td>
<td>April 6, 2021</td>
<td>45:55</td>
</tr>
<tr>
<td>SCM3</td>
<td>Scrum Master</td>
<td>April 6, 2021</td>
<td>43:30</td>
</tr>
<tr>
<td>SCM4</td>
<td>Scrum Master</td>
<td>April 7, 2021</td>
<td>41:27</td>
</tr>
<tr>
<td>SCM5</td>
<td>Scrum Master</td>
<td>April 8, 2021</td>
<td>27:59</td>
</tr>
<tr>
<td>SCM6</td>
<td>Scrum Master</td>
<td>April 15, 2021</td>
<td>41:22</td>
</tr>
<tr>
<td>SCM7</td>
<td>Scrum Master</td>
<td>April 23, 2021</td>
<td>38:02</td>
</tr>
<tr>
<td>RTM1</td>
<td>Remote Team Member</td>
<td>May 10, 2021</td>
<td>31:07</td>
</tr>
<tr>
<td>RTM2</td>
<td>Remote Team Member</td>
<td>May 20, 2021</td>
<td>15:38</td>
</tr>
<tr>
<td>RTM3</td>
<td>Remote Team Member</td>
<td>May 20, 2021</td>
<td>34:52</td>
</tr>
<tr>
<td>RTM4</td>
<td>Remote Team Member</td>
<td>May 26, 2021</td>
<td>51:31</td>
</tr>
</tbody>
</table>

Interviews were expected to last 60 minutes. The interviews ranged in time from 15:38 to 51:31 minutes, with an average interview length of 37:16 minutes. Scrum Master interviews were slightly longer, averaging 39.02 minutes, and remote team members 33:07 minutes. Table 2 provides participant and interview information.

The goal of the case study was to answer the research questions by obtaining rich content based on the interviews and conversations with Agile team members, specifically Scrum Masters and geographically distributed team members. The interview questions were derived with assistance from the conceptual framework based on leadership, management, and control theories. The researcher used the interview instruments to extract insight into the attributes and qualities displayed by robust and successful Scrum Masters. Stake (2010) noted that qualitative research enables the researcher to delve into participants' personal views and thoughts.
Volunteer participants were interviewed using semi-structured interview questions during Microsoft Team audio-only meetings. All interviewees were either experienced Scrum Masters or members of a remote Agile team. Demographics relating to Agile training, project management, or Agile certification and years of experience were captured to substantiate the results.

The study participants all work for the target organization in IT-related positions as Scrum Masters or Agile team members, indicating they perform Scrum Master or Agile team member responsibilities at least 50% of their working time. Over 50% of the participants had 20 or more years of work experience, predominately in IT, while 90% had ten years or more, with the average working years equaling 21 years. Interestingly, 73% of the participants had Agile experience ranging from only 2-4 years. 57% of the Scrum Masters obtained Scrum Master certification from the Scrum Alliance. Of those certified, 25% had prior project management experience. While only one Scrum Master indicated studying a project management-related field at the collegiate level, 71% had received in-house company Agile training. Furthermore, 71% of the Scrum Masters had additional Agile training external to the organization. On the other hand, none of the remote Agile team members were certified in project management or Agile methodologies, though all had received in-house Agile training.

Each interview began with a general overview of the participant's work experience and specific questions directed at involvement with Agile project approaches. The researcher then raised queries asking for the definition of sprint success and how Scrum Masters support sprint success. Each participant was then asked to provide details of sprint-related meetings, specifically focused on the daily stand-up but also including sprint planning and sprint retrospectives. The conversation then focused on questions to gather insight into the leadership
and management styles of Scrum Masters and how those styles impact the sprint. Lastly, each interviewee was asked a set of questions to gather data on Scrum Master characteristics and skills deemed helpful in achieving sprint success.

Using Microsoft Teams, the audio recording of each interview was captured, along with field notes taken by the researcher. The recordings were transcribed, and the content was evaluated for emergent patterns and themes. Moreover, each transcript was coded manually by the researcher, identifying patterns and themes from the perceptions and words of each interviewee. Using NVivo, the analysis details were amalgamated, pulling together emergent themes to be disclosed in the presentation of findings. To determine the reliability of the data, a triangulation of the data was completed comparing the actual and the anticipated themes based on the literature review.

**Anticipated Themes/Perceptions**

After a thorough review of the literature, the researcher expected several themes to emerge during the interviews, including leadership and management styles and personal characteristics, and soft skills prevalent among successful Scrum Masters. Scrum Master skills, including technical and soft skills, are also potential contributors to sprint success. Additionally, from the perspective of both Scrum Masters and team members, understanding the Agile framework was seen as a necessary contributor to the leadership and success of the team to meet sprint expectations. Although the researcher planned for and questioned unsupportive behaviors and characteristics of Scrum Masters, this theme did not emerge as widely as anticipated. The analysis of unsupportive traits will be further discussed in the presentation of findings.
Presentation of the Findings

The transcripts from the semi-structured interviews contained a range of various points of view and perspectives from the sample size of 11 participants. A list of defined questions was reviewed in each session, depending on the interviewees' designated group, Scrum master, or remote team member. Appendix A maintains the questions directed to the scrum masters, and Appendix B holds the questions reserved for the remote team members. Interview sessions were held until the point of data saturation, and no new themes were presented. Seven interviews were necessary to reach data saturation with the Scrum Master participants. In comparison, only four interviews were required for remote team members before the researcher noticed repetition in answers among the participants.

Following data collection and coding, data analysis occurred. During the analysis and review of the data, various themes were identified. The following themes, listed in Table 3, emerged during the interviews and will be discussed in the presentation of findings.

*Emergent Themes*

<table>
<thead>
<tr>
<th>Theme Number</th>
<th>Theme Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theme 1</td>
<td>Perception of Sprint Success</td>
</tr>
<tr>
<td>Theme 2</td>
<td>Awareness of Scrum Master Leadership and Management Style</td>
</tr>
<tr>
<td>Theme 3</td>
<td>Observation of Scrum Master Behaviors and Characteristics</td>
</tr>
<tr>
<td>Theme 4</td>
<td>Perception of Scrum Master Behaviors and Actions</td>
</tr>
<tr>
<td>Theme 5</td>
<td>Experience of Scrum Master Interaction and Engagement with Remote Team</td>
</tr>
<tr>
<td>Theme 6</td>
<td>Views on Agile Education and Training</td>
</tr>
</tbody>
</table>

*Table 3*
Emergent Themes

Theme 1: Perceptions of Sprint Success

Each study participant was asked to provide their definition of sprint success. The perception of success between the two groups was consistent with comments concerning success viewed from the Agile team and customer angles. A majority of the participants viewed sprint success as making sure they met the requirements they had committed to with the customer. Additionally, participants indicated completing the tasks or user stories they had personally agreed on and handing them over for user testing as success. Completion of the user stories selected during the sprint planning improved satisfaction by the customer, other stakeholders, and team members. Self-organization, effort estimation, and the definition of done were identified as critical determinants of sprint success. The standard definition of Scrum sprint success is to deliver the user stories agreed upon for the sprint on time regarding both functionality and quality. The study members commonly shared a comparable definition of sprint success that included these factors as the foundation of sprint success. Participant RTM3 stated, “a sprint is successful when the definition of done has been met, and all work packages have been turned over for testing.”

Furthermore, participant RTM4 explained,

Success is making sure we meet the requirements we have committed to with our customers. Success is completing the requirements that we put on ourselves. You are the one as an individual that determines the amount of work you are going to be facing for the next couple of weeks. Nobody dictates that to you.
THE IMPACT OF AGILE PROJECT MANAGEMENT

SCM6 added support to that comment by indicating, “you know, making sure that the stakeholders are aware of the work that is being done within the team. They are setting priorities and that you are fulfilling those priorities that are set.”

In addition to sprint commitments and the definition of done, several participants indicated that a successful sprint includes associates enjoying the work and collaborating well within the team. RTM1 shared, “As far as I see it being successful is the way it brings team members together to collaborate and complete tasks in a timely fashion.” SCM4 expanded on that thought, stating a sprint is successful “if the team works well together and meets the sprint goal.” Most study participants commented on customer satisfaction and team member fulfillment being linked to sprint success. Specifically, remote team members mentioned the need for the team to be cohesive, develop camaraderie, and collaborate to deliver value to the customer each sprint.

Each group was asked how the Scrum Master supports sprint success. Accordingly, each set of participants had slightly different thoughts. RTM1 indicated the “Scrum Master brings the team together to complete tasks” by organizing and running the necessary meetings, “showing the progress of planned versus achieved,” and “making the members feel involved.” The remote team members interviewed displayed affinity for their current Scrum Master, commenting “excellent,” “motivational,” and “energetic.” RTM1 felt that “Our Scrum Master is excellent. He is very energetic and makes members feel involved.” RTM3 added, “The Scrum Master supports the team by conducting the meetings, taking notice of the backlog, keeping the team moving forward, and being efficient.”

Scrum Masters saw their contribution to sprint success with a similar sentiment. Many Scrum Masters felt being realistic with sprint demand, bringing value to the team members
through organization and priority planning, and advocating for team members as actions that increased sprint success and team member satisfaction. SCM2 remarked, as a Scrum Master, “I moderate the meetings, keep the meetings valuable for the team, and the other big thing for our role that I think is often looked past is being the developer advocate for the team.”

I help the team to basically construct a system that works for them. I try to achieve a good harmonic balance between team construction and collaboration and the working culture and environment as a strategy in terms of applying Agile and Lean principles. Keeping those principles in mind and using them as filters to solve problems and optimize the work. (SCM3)

SCM4 and SCM5 both indicated they support their teams by being the primary driver for maintaining transparency, team spirit, motivation, and removing obstacles to forward progress. SCM4 explained, “It’s my job to maintain spirit, motivation, and help make things visible to the team. Removing blockers is the key.”

**Interpretation of Theme 1.** The theme of sprint success was the overarching concept of this research study and is related to facets of two primary research questions. As defined by the study participants, Sprint success was to deliver to customer expectations work packages that met functional and quality requirements. In previous studies, Agile project management enhanced planning flexibility, streamlined processes, and delivered increased value to the customer using iterations and increments in short cycles (Boehm, 2002; Dingsøyr et al., 2012; Novac & Ciochină, 2018). Additionally, many participants mentioned team cohesiveness, camaraderie, and team member satisfaction as proponents of sprint success. In pure agile teams, members are the drivers of their own destiny, in that sprint planning meetings are team-centric, with individual members agreeing to the topics and depth of work package assignments. Hidalgo
(2019) and Zada et al. (2015) noted that sprint success depends on team member cooperation and collaboration.

Both groups of participants agreed the Scrum Master needs to champion sprint success and relayed key perceptions on actions and functions that allow the Scrum Master to support the team and guide them to a successful sprint conclusion. Advocating for the team by providing transparency, organization, and a working methodology founded in solid Agile practices aided sprint success and team member satisfaction. Barke and Prechelt (2019), Conboy and Carroll (2019), and Sibona et al. (2018) all indicated the Scrum Master supports the team by being the primary organizer of team functions and coaching Agile framework, practices, and theories. Furthermore, the study participants indicated the Scrum Master is responsible for cultivating Scrum principles and norms while removing obstacles to progress. Cervone (2011) noted the essential job of the Scrum Master is to remove barriers to team advancement.

**Representation and Visualization of the Data of Theme 1.** The word cloud in Figure 5 illustrates the words most commonly captured during the discussions on sprint success and how the Scrum Master supports sprint success. This visual representation of participant words identifies and correlates to the rich content depicted in the interviewees' quotes supporting the interpretation of the theme.
A word frequency chart depicting the 40 words most used during the interviews can be found in Appendix C. The chart does not include project-defined stop words and is based on grouping stemmed words to avoid repetition and excess data.

**Theme 2: Awareness of Scrum Master Management and leadership Style**

The second theme identified was awareness of Scrum Master leadership and management styles. Study participants had varying views on Scrum Master leadership and management styles. Regarding the management style of Scrum Masters, most participants suggested that Scrum Masters are not managers in the traditional supervisory sense. RTM1 conveyed, “He is not so much a management leader; I don’t see him in that role.” However, regardless of their group designation, the interviewees indicated that Scrum Masters must master soft skills in people management. While the Scrum Master is not considered a manager of the Agile team, remote team members noted there is a need for the Scrum Master to display certain management aptitudes. RTM3 specifically stated, “It is important [for the Scrum Master] to be able to deal
with people. Having the ability to read body language, switch gears easily, and mitigate problems.” Several Scrum Masters voiced a similar sentiment in dealing with their teams. SCM4 expressed the need to understand the team, what drives each member, and their problems. “Being aware of tone and voice inflections, even facial expressions, because how a person feels impacts how they work.”

Considering the framework methodology of Agile projects, SCM1 shared, “[Scrum Masters need a] management style [that is] democratic, trying to work with each team member, being open to new ideas and enabling the employees.” Further supporting this concept of associate empowerment, SCM4 commented, “[Scrum Masters need to be] disciplined, able to keep the team on track, draw people into the conversation, keep them engaged, [and] hear their voices.” SCM5 added, “[The Scrum Master] needs to know and acknowledge the team’s strengths and weaknesses. Additionally, [he can’t be] a micro-manager. Trust the team to complete tasks, and give a free hand to function within their area of expertise. In Agile, the team needs freedom to perform, not pressure.” And while the Scrum Master does not typically have disciplinary responsibility for the team, SCM6 revealed that a Scrum Master must understand and realize the role upfront and, on occasion, be prepared “to have uncomfortable conversations and address areas of improvement within the team.”

The remote team members interviewed for the study looked to their Scrum Master for guidance, organization, and initiative. RTM1 commented, “[My Scrum Master] is open and friendly. Easy to approach, reachable, and removes roadblocks.” The Scrum Masters supported these statements with a joint agreement that honesty, approachability, and openness were crucial for building relationships and championing the team. SCM2 shared, “I try to put things in perspective and lead by reality.” Both SCM1 and SCM3 indicated they develop relationships
with their team members by guiding and coaching in directions that bring understanding and resolution to open points.

A reoccurring theme evident in the literature review was the difference between transactional and transformational leadership. The SCM participants provided insight into how they approach leadership within their teams, including advocating for team members, understanding, championing team goals, and supporting team members to meet sprint goals. During the interviews, several Scrum Master participants considered motivation and transformational leadership an essential aspect of their leadership style to influence team members' commitment to sprint targets. SCM4 referred to transformational leadership by stating, “If I know I need the team to move in a certain direction or I want them to exhibit certain behaviors, then I’m the first one to do that.” SCM7 followed that thought up by allowing the team member to come to the realization “without speaking in absolutes but trying to lead in a direction without giving an answer.”

**Interpretation of Theme 2.** Based on the literature review, specifically Kisielnicki and Misiak’s (2017) comparison of Waterfall and Agile methodologies, the influence of leadership and management style emerged as a theme for sprint success. The critical criteria identified by the study participants highlighted the importance of the individual team members, allowing team self-organization, and supporting collaborative leadership. Antonakis and House (2014) discussed higher levels of engagement between Scrum Masters and team members when transformational leadership was practiced because it leads to an environment of mutual encouragement fostering motivated activities and solutions. Zheng et al. (2016) confirmed that network management is valuable in identifying team interaction patterns, including communication, collaboration, performance, and resource management. While not explicitly
specified by study participants, transformation leadership and network management were prevalently discussed during the interviews. Most interviewees stated that the Scrum Master’s leadership style encouraged successful sprints, such as being people-focused and a management style that promotes team collaboration and communication. These recognized styles appear directly in the conceptual framework and influence sprint success, both from a Scrum Master and team member perspective. Furthermore, the leadership and management style of the Scrum Master was seen to impact the team, influencing actions and behaviors that affect the working environment, culture, team interactions, and value provided to the customer.

**Representation and Visualization of the Data of Theme 2.** The word cloud in Figure 6 displays the 100 most frequently used words in the interviews when discussing Scrum Master leadership and management styles. This grouping of words correlates to the themes that emerged during the data analysis, reflecting the actual terms and sentiments the participants said and displayed during the interviews. Not only were these words brought up in the discussions with nearly all participants, but they also demonstrated a clear link with the literature review displaying concepts and styles that embody the Agile approach to project management. Frequently repeated words such as relationships, team, people, open, and approachable show what team members expect and see in their Scrum Masters. The cloud also represents how current Scrum Masters strive to portray themselves and lead their teams through quality and value-addng sprints.
Theme 3: Observation of Scrum Master Skills and Characteristics

Each study participant was asked to discuss Scrum Master skills and characteristics that support sprint success and team member engagement. Most participants, regardless of group, indicated that communication skills are paramount for sprint planning and management and when dealing with various team members and other stakeholders. Several interviewees commented that because Scrum Masters do not generally have disciplinary responsibility for team members, soft, practical skills such as communication and organization are even more important in coordinating and achieving team activities.

You have to be almost a people person and know how to read inflections in the conversation, how someone is addressing you. So really, the Scrum Master, in my opinion, is like the ringmaster of the circus. Coordinating people, making sure the artifacts are organized, and dealing with the user department. (RTM3)
RTM4 also mentioned that while technical skills can be learned, it is the soft skills such as being “personable, easy to talk to, [having an] open-door policy, open to improvements, and good feedback” that impact the team’s culture and working environment in relation to the Scrum Master. The Scrum Masters that were interviewed agreed with this remote team member viewpoint. SCM5 commented, “I think you should have very good communication [skills] as a Scrum Master, and that skill [communication] is mandatory for creating and maintaining valuable dialogue with the team.” SCM4 shared as the leader of the team. The Scrum Master needs to plan and help the team formulate a plan for addressing user stories and managing time during the sprint. “Help the team understand when to ask for help and that it is ok to ask for help.”

Answers from the Scrum Master perspective provided additional detail upon further analysis of the same skill question. SCM1 shared, “It is important as the Scrum Master to understand the principles and practices of the Agile project methodology. Having a good read on the team to understand group dynamics and the ability to hold people accountable.” Multiple Scrum Masters referred to the necessity to understand and follow the Agile Scrum framework fully. Teaching the Agile framework to the team members yet allowing them to adapt specific aspects of the methodology aided in team success. SCM3 explained, “I help the team to construct a system that works for them by applying Agile and Lean principles that are appropriate for the situation and using those principles as filters to solve problems and optimize the work.” Furthermore, SCM6 suggested the significance of understanding the difference between the team and the framework. SCM3 continued by stating that Scrum Masters must-have “professional competency and experience. Being able to understand situations and have real-world experience to where you’re not just going to the book and throwing out theoretical probability to people.”
As noted by Alzoubi et al. (2016), the basis of Agile’s momentum and adaptability is rooted in team knowledge sharing, cohesiveness, and cooperation enabled by effective communication. Agile projects are most successful when communication and collaboration are prominent and promoted by project leaders (Holzmann & Panizel, 2013; Yagüe et al., 2016).

Within IT projects, hard skills such as computer savvy, comprehension of technical jargon, attention to detail, and solid organizational skills are highly demanded. RTM3 supported this observation and noted that Scrum Master’s must possess “good computer skills, a technical vocabulary, good organization skills, and keeping an eye on the budget.” In support of learned technical skills, RTM4 also indicated the Scrum Master must retain relevant project capabilities. Further discussion of education and training will be addressed as a separate theme in the presentation of findings.

As evidenced by discussions with the participants, specific characteristics of successful Scrum Masters were also noted to significantly impact the environment, culture, and team interaction with the Scrum Master. As an experienced Scrum Master, SCM7 commented, “Empathy is a very necessary characteristic [for Scrum Masters] to possess.” From the team member group, RTM3 agreed that Scrum Masters must display the necessary traits to support the team, “Empathy is needed to understand the development work and attention to detail.” Supporting that sentiment, SCM4 noted that “[Scrum Masters] need to be observant, with the ability to read people, understand what drives them, recognize problems, and understand body language.” SCM7 stated, “As a leader, the Scrum Master must understand team dynamics and bring more coaching to this complex role.” Additionally, they should provide a better customer experience using basic scrum such as requirements gathering and helping the team navigate and develop. Lastly, manage the “chaos.” Several study participants suggested that personality
impacts the team, how the members interact among themselves, and how they engage with the Scrum Master. RTM3 continued, “Personality really impacts the team.”

**Interpretation of Theme 3.** According to the study participants, management skills and personal characteristics impact effectiveness, specifically for teams requiring a close working environment and open atmosphere. The skills and characteristics displayed by Scrum Masters impact the project team members individually and as a group. Communication ranked high as a necessary skill, as indicated by both participant groups. Predominately, verbal communication over written communication was conveyed during the interviews. The Scrum Master's engagement and interaction with the team as a whole and with individual team members were noted to enable open dialogue within the team and impact the effectiveness of coaching from the Scrum Master. Several interviews also indicated that Scrum Master's soft skills such as organization and communication and personal characteristics affect other project stakeholders, overall sprint direction, and even the level of sprint success.

The identified skills and characteristics help to define the role of the Scrum Master and the traits that support this highly complex position within the Agile team. Empathy was the dominant characteristic mentioned by study participants. The Scrum Master’s ability to sympathize and understand each team member’s working style, strengths, weaknesses, and traits such as behavior, knowledge, and disposition aid in interpersonal collaboration and enablement. The cognizance of similarities and differences in team member work and communication styles allows project leaders to influence the working atmosphere and team culture. As stated previously, Scrum Masters typically do not have disciplinary responsibility for the project team. Therefore, influencing, coaching, and communicating are essential to manage and direct the team within an Agile framework.
Representation and Visualization of the Data of Theme 3. The word cloud in Figure 7 displays the 50 most frequently used words in the interviews when discussing Scrum Master skills and characteristics. This grouping of words correlates to the themes that emerged during the data analysis, reflecting the actual terms and sentiments the participants expressed and emphasized during the interview sessions. The words most frequently associated with the literature review present skills and characteristics that describe what team members expect of a Scrum Master and what those in Scrum Master roles consider important for the leadership and coordination of team activities. Frequently used words included coaching, empathy, credibility, coaching, and accountability. This cloud indicates the skills and characteristics Scrum Masters strive to use to engage and guide their self-directed teams.

Figure 7
Skill and Characteristic Word Cloud

Theme 4: Perception of Scrum Master Behaviors and Actions

Both groups of study participants were asked to describe and comment on supportive and non-supportive Scrum Master behaviors and actions. The questions relate to behaviors and actions built on previous skills and characteristics. Several Scrum Masters stated the need for continued flexibility and signs of compassion and understanding for team member work
situations. For instance, SCM2 said, “There is no customer deadline that is more important than your mental or physical health.” SCM7 indicated, “I sometimes think of the Scrum Master role as kind of a shepherd and sometimes being an armchair psychologist.” The SCMs agreed that Scrum Masters need to take ownership of the team yet bend the rules where appropriate, applying to both team members and the Agile framework. SCM6 stated, “We deviate from the framework, and we acknowledge it, and for this team, it will be better [than being 100% Agile compliant].” Several SCMs acknowledged flexibility in applying Agile methodologies, and the related mindset is necessary for team experience and success. SCM7 commented, “It is definitely more than just dotting the ‘I’ and crossing the ‘t.’” It is about the team and what works best to support work during the sprint and bring valuable completion to user stories.

The remote team members also shared their thoughts and experiences with supportive behaviors. Several remote team participants reinforced and shared the same thoughts as the Scrum Masters. RTM1 noted, “The Scrum Master uses the framework for the benefit of the team.” The adaptability of the framework and the openness and flexibility of the Scrum Master allows the team to focus on aspects of the model that are beneficial for that specific group of people. RTM1 went on to mention, “It is helpful that the Scrum Master is easy to reach and good for listening to collaboration ideas and various viewpoints. There are quite a few of the Scrum Master’s personality traits that are helpful to the team dynamics.” RTM3 and RTM4 both indicated the importance of Scrum Masters “displaying grace under fire” and “controlling the team and meetings as facilitators and communicators opposed to dictators.”

While personality traits of the Scrum Master can be beneficial to team engagement and interaction, some traits appear to be unsupportive. RTM3 shared, “Personality really impacts the team. [We had a Scrum Master] with a military background, and you could tell it offended a lot
of people. [This person] was very professional, but there was a lot of complaining.” Other RTM participants shared stories of teams being split apart, extinguishing the camaraderie and team synergies. RTM4 shared, “When the team and the Scrum Master didn’t understand the Agile concept, it took three to six months for everyone to understand and shift to an Agile way of work.” It was continually expressed by several of the study participants, SCM and RTM alike, that Scrum Masters must understand the Agile framework thoroughly, be people-centric, and understand the Scrum Master is not a disciplinarian. RTM1 stated, “Remote work is different. It can require more time and scheduling.” SCM1 indicated that COVID-19 highlighted the inefficiencies and problems areas of remote work, “we need better ways to engage and organize the team.” Furthermore, “Scrum Masters and the entire team need to be knowledgable about Agile concepts and methodologies, onboarding and integrating team members” (SCM1). Overall, both groups also included self-motivation and organization as crucial behaviors of successful sprints.

**Interpretation of Theme 4.** The interviews show that Scrum Master's behavior and actions taken are noticed and valued by the team members. While everyone brings unique characteristics and skills to their role, flexibility, openness, and adaptability are central to Agile management. The foundation of Agile Scrum projects is for the team to self-organize and be self-motivated with the Scrum Master removing blocking points, obstacles, and barriers to progress. The top-down management approach does not apply or work well within this concept. As documented by Barke and Prechelt (2019), Conboy and Carroll (2019), and Sibona et al. (2018), the Scrum Master is the coach, organizer, and trainer supporting team members in understanding and applying Agile concepts and philosophies. Scrum Master's lack of knowledge of the Agile approach was noted as an unsupportive behavior. It hindered the team's use of Agile principles
resulting in sprint delays and unorganized and inefficient meetings. Moe and Šmite (2008) noted an absence of compliance with Agile principles elevates inadequate team member socialization, substandard socio-cultural adjustment, and incongruent work standards. Additionally, the Scrum Master holds the primary responsibility to promote and enable team communication and collaboration while also removing barriers and blockers facing the team (Usman et al., 2016). Study participants indicated that successful Scrum Masters work alongside team members and that active listening, flexibility in applying Agile principles, and accessibility were desirable Scrum Master behaviors.

In discussing unsupportive Scrum Master behavior and actions, remote team members indicated feelings of isolation, lack of Agile project knowledge, and conflict as barriers to motivation, collaboration, and overall sprint success. Working remotely was addressed by almost all interviewees. While it was predominately mentioned that remote work is the way of the future and allows for more diverse teams, it also has its drawbacks if not handled appropriately by the Scrum Master (Dorairaj et al., 2012; Moe & Šmite, 2008). This sentiment was further backed up by Moe and Šmite (2008) by acknowledging a remote team’s lack of compliance and consistency in applying Agile practices can significantly impact team collaboration, adjustment, and work standards. There is a chance that unsupportive and disengaged Scrum Masters can negatively impact communication, coordination, and collaboration (Dorairaj et al., 2012; Xia et al., 2015).

**Representation and Visualization of the Data of Theme 4.** Figure 8 displays 50 of the most frequently used words when discussing supportive actions and behaviors of Scrum Masters. This word cloud associates the terms and examples provided by the study participants as they relate to actions and behaviors of engaging Scrum Masters. These words relate to the literature review representing a blend of actions and behaviors that remote team members expect of a
Scrum Master and what Scrum Masters deem significant for involving and enabling their teams. Frequently mentioned words comprised benefit, bending, helpful, interact, and personality. This word cloud blends rich language and content that describes the expectations of Scrum Master behavior and actions in exchanges with distributed team members.

Figure 9 displays the 50 most frequently used words when discussing unsupportive Scrum Master behaviors and actions. The literature review largely supported the expressions and statements of the study participants. The negative connotations of many of the words exhibited in Figure 9 correspond to previous study results signifying the importance of the Scrum Master’s role in Agile environments.

**Figure 8**

*Supportive Behaviors and Actions Word Cloud*
Theme 5: Experience of Scrum Master Interaction and Engagement with Remote Team

The fifth theme that emerged from the analysis of the interviews pertains to how remote team members experience interactions with their Scrum Master. Several of the interview questions wove responses together in forming this theme. Topics included participation in the daily stand-up meetings and other Agile-related planning and retrospective meetings, benefits of meeting attendance, and differences between remote and on-site team members. It was typical for some team members to be co-located with the Scrum Master pre-pandemic. In contrast, others were positioned across the globe in vastly different time zones. By the 2nd quarter of 2020, remote work was mandatory for all team members due to the COVID-19 pandemic and contributed to all team members' recognition of Scrum Master engagement. The move to fully remote teams forced the Scrum Master to deal virtually with all members and meetings.

I can tell you it’s been quite a challenge working distributedly. [I joined the team right before the quarantine started] when we became fully distributed. I didn’t know the team very well, and now suddenly, I have to get them to work in an Agile way. I also had a
product owner that didn’t know how or want to be a product owner. Trying to train those
types of individuals and their behaviors to form an Agile team was a test. (SCM4)

When discussing the involvement of team members in the sprint meetings, 100% of the Scrum
Masters indicated team members with active user stories should be involved in all the sessions.
Meetings are scheduled considering the time zone of the members, and only in exceptional
instances such as conflicts or holidays would members be excused. SCM4 vehemently stated,
“Team members should not be excluded. What should happen is even if you're not included,
there should always be that continuous feedback loop.”

Both participant groups indicated no difference when discussing the differences between
remote team members and co-located members. SCM5 shared, “There is no difference between
team members whether on-site or globally located. The benefit of the global team is the diversity
of thought, culture, and different solutions.” RTM4 stated, “We are one team. Everyone is
included to promote team cohesiveness.” SCM2 indicated, “The team is the team.” SCM3 added,
Everyone is getting the same information in [the] first-person, and the information is not
being relayed or translated. This helps members bond and reduce silos—people like
being connected with people. Different cultures have different viewpoints and
perspectives, and [members] start learning some of those characteristics and tendencies.

The majority of SCM participants shared similar expressions and experiences with their
Agile teams. SCM3 commented, “I don’t know of a situation where there hasn’t been a team that
has had some distribution, even without COVID. Typically, the teams are distributed.” However,
one Scrum Masters indicated that meeting other team members face to face sped up and
strengthened collaboration and team cohesiveness.
I can see some of the disconnects with associates being [across the globe], but what I noticed helps them is when there were a couple of those people who came here on assignment. They were here for anywhere from 3 to 9 months, and they got a chance to work with our team. The relationships automatically improved because we had a chance to see them face to face and work together. You notice that the people who were together engage the most. (SCM4)

Overall, Scrum Masters and remote team members agreed that there is value in attending Agile meetings and having the entire team involved. SCM1 commented, “Daily stand-up meetings are efficient for users and the project team.” SCM6 shared that opinion and further stated,

The big benefit me and all of our team members get from Scrum is that we have a daily check-in with the team, raising the bar of collective intelligence within the team. It is a way of updating what we’re working on. The entire team has a certain level of experience just by listening in and hearing the various things we’re working on.

From the remote team member perspective, both RTM2 and RTM3 concurred that having all team members in Agile meetings increased camaraderie and teamwork. RTM1 summed up the thoughts with, “We are able to get other perspectives with everyone in the meetings. It is helpful to see what others are working on or have accomplished.”

**Interpretation of Theme 5.** Engagement between Scrum Masters and their remote team members and interaction between all team members was deemed beneficial to the team synergies and interactions by all study participants. Calefato and Ebert (2019) stressed the importance of global team collaboration. The significance of in-depth transparency is needed to foster seamless collaboration for distributed teams (Calefato & Ebert, 2019). The study responses and shared
experiences describe the prominence of engagement and inclusion of all team members. The interviewees notably discussed the need for all team members to be aware of current topics, issues, and success. A continuous loop of information is one of the basic principles of Agile projects, aiding in the delivery of sprint iterations and helping to promote team member impact and involvement (Defranco & Laplante, 2018). Dingsoyr et al. (2014) indicated a collaborative working environment is vital to team coordination.

Furthermore, daily stand-up meetings, planning sessions, and sprint retrospectives are the crux of Agile Scrum methodologies (Dingsoyr et al., 2016). Although most participants indicated co-located teams are easier to manage, coordinate, and engage with, only one SCM heartily supported this approach. The overwhelming majority of participants disclosed diverse perspectives, cultures, and experiences of distributed teams stimulated ideas and discussion, leading to improved performance. Mtsweni (2017) concluded that organizing team dependencies requires frequent exchanges between members to recognize changing requirements, ensuing continuous feedback, effectively enhancing the team’s performance.

**Representation and Visualization of the Data of Theme 5.** Theme 5 delved into experiences and thoughts regarding the involvement of all team members in Agile meetings. Specifically, each study participant was asked to share encounters and views on the engagement of distributed team members. Scrum Masters and remote team members alike place significant importance on all team members being involved in the array of Agile sprint meetings, see Figure 10. Interesting to note from this figure is that SCM1, who did not place great importance on including all team members, was the newest Scrum Master and came from a Waterfall environment. The findings from the figure coincide with the literature review indicating the differences between Agile and Waterfall methodologies and display the perceptions of
experienced Agile project members, both team members and Scrum Masters. Overall, those
participants with multiple Agile project experiences discussed the importance of diversity and
included all team members in Agile meetings most frequently and at most length.

Recurrently used words during the discussion of Scrum Master engagement and
interaction with Agile team members are displayed in Figure 11. These 50 words provide a sense
of the importance study participants placed on involving the entire team in Agile meetings and
the meaning of the interactions and engagements with Scrum Masters. Additionally, these words
correlate with the literature review expressing why and how remote team members have
associated with other team members and the Scrum Master. Frequently mentioned words were
culture, connect, include, and everybody. This word cloud brings together descriptive words that
relay the participant’s perceptions and viewpoints concerning engagement and interaction with
Scrum Masters.

Figure 10

Coding of Including All Members in Meetings
Theme 6: Views on Agile Education and Training

Study participants had similar views of what constitutes valuable training and certification. Most SCM participants had Agile training, in-house, external, or both, and had Agile certification. On the other hand, no RTM had Agile training of any kind. Concerning University studies, two SCM participants had collegiate level courses that could be deemed beneficial to leading Agile projects. SCM4 is currently working on a bachelor’s degree and has changed the focus of the degree to complement Agile methodologies, integrating leadership studies and emotional intelligence. SCM7 shared that coaching, team psychology, and organizational management classes also benefited Scrum Masters in managing and directing their teams.
I’ve very much developed an interest in learning, not formal, but just autodidactic, if you will, sort of learning team psychology, individual psychology, things like that, and kind of learning how to speak using different speech patterns, even to the point of sometimes people being frustrated and not speaking in absolutes, but trying to lead in a direction without giving an answer. I was kind of told early on that being a Scrum Master is kind of an armchair psychologist, and I embraced that. (SCM7)

While most participants agreed on the necessity of training and the importance of continuing education, there were varying views on whether in-house training or external training was more beneficial. The earliest Agile adaptors, SCM6 and SCM7, purposely took no in-house training. SCM7 shared, “I never took [in-house] training, and I avoided them on purpose. Agile was just becoming popular, and we wanted the general overview, as opposed to [the company line].”

Additionally, not all participants agreed on the subject of certification. Both SCM6 and SCM7 have extensive external training and accreditation through the SCRUM Alliance, including certified Scrum Master and Product Owner. Collectively, 86% of the Scrum Masters had at least one project management certification, with 57% explicitly being certified Scrum Masters. All other Scrum Masters had company Agile training, with 60% having additional external training.

As Agile became a prominent project approach, the organization promoted Agile tools and methodologies across departments and various business units. Therefore, some Scrum Masters started their Agile journey by taking courses offered internally by the company. SCM3 shared, “I took the training classes provided in-house by the company, trying to understand how [the company] handles situations and the Agile approach.” SCM4 commented, “I took an
advocate training class taught by [the company]. It was a quick start class, and it piqued my interest. I have had a lot of on-the-job training, my manager is an Agile coach, and I have done a lot of reading.”

**Interpretation of Theme 6.** Several thoughts are embodied in this theme relating to education and training. Principally, Agile is relatively new to the world of project management. As noted by Dingsøyr et al. (2012), the Agile Manifesto, which provides the framework of the methodology, was developed approximately 20 years ago. RTM3 helped to clarify this by indicating, “I think it was 2009 before the department of defense finally embraced iterative programming.” It takes companies a substantial amount of time to adapt to significant differences in their organizational template as it impacts strategic decisions and priorities and corporate practices and structure (Vilkas et al., 2019). The discussions with study participants made it clear the target corporation is still adjusting to Agile methodologies and determining where and how they are best suited to support the mission and strategic goals of the organization.

Overall, the participants deemed training valuable to Scrum Master activities, with all SCMs having training and some pursuing continuing education at the collegiate level. The importance of training was focused on the ability of the Scrum Master to effectively utilize and administer an Agile framework for the betterment of the project and the team members. As indicated in a previous theme, most SCM participants specified the framework is for the team's benefit. Therefore, it is advantageous for the entire team to be knowledgeable about Agile principles.

Unlike Waterfall projects which rely on vast amounts of documentation that provide a historical record of gained knowledge and experience, Agile projects lack that information and depend instead on the Scrum Master to aid in new member training and onboarding. This case
study would seem to support that concept as none of the remote team members had received Agile training. Additionally, Crespo-Santiago and Cosme (2011) noted that shifting from Waterfall to Agile projects can be disruptive to the organization, changing from a top-down to a bottom-up structure. SCM1 shared, “The new changes are coming up in our world as well as the work that we are doing within our organization, the policies, and the rules. The [Scrum Master] needs to incorporate these within the project and make it work.” As organizations jockey for position in the global digital transformation, the demand for reduced development times, shorter product lifecycles, and increased customization are supported by Agile competencies and practices (Dingsoyr et al., 2019). SCM3 summed it up quite well, “The Agile world is a journey.”

**Representation and Visualization of the Data of Theme 6.** Figure 12 shows the length of service to the company in years against the number of Agile experience years. Except for SCM2, who started at the organization in an Agile capacity, all participants have a minimum of 11 years of experience at the company, with the most experience in Agile being only nine years. Aside from the self-identified early adapters, Agile experience averaged between two and four years for the Scrum Masters. This figure supports the assertions of several of the study participants that Agile is a relatively new concept in the target organization and is still maturing.
Nearly 80% of those interviewed had received company Agile training, and over half, 55%, had external training (see Figure 13). External training included LinkedIn, Scrum Alliance, and the Project Management Institute. Internal training was attended by eight of the 11 participants. Out of the three participants that did not have company training, two had purposely not attended in-house training. In contrast, the remaining participant had not yet attended training but had the potential in the future. The organization supports internal and external training as well as certification aspirations of associates, signifying the importance of the topic. Figure 14 shows the various certifications attained by the study participants. Only those participants identified as Scrum Masters had received certification. Except for SCM5, all SCMs had at least one certification. Both SCM1 and SCM5 had Waterfall project management experience prior to joining or leading Agile projects. SCM1 was project management certified and was actively pursuing Scrum Master certification. The percentage of those with collegiate level Agile training was relatively low at 18%. The low rate of participants with college-level Agile training is
indicative of the “newness” of Agile concepts compared to the vast number of years of work experience most participants had.

**Figure 13**

*Participant Training*

**Figure 14**

*Number of Project Management Certifications*
Saturation and Triangulation

Throughout this study, both triangulation and saturation have been discussed. In qualitative research, saturation is reached when the data becomes recurrent (Braun & Clarke, 2019). Van Rijnsoever (2017) suggested identifying relevant codes is more important than the number of codes to reach theoretical saturation. Moreover, Malterud et al. (2016) and Roland (2016) discussed that populations that exhibit similarity necessitate reduced sample sizes to attain saturation. The sampling decision was based on participant selection to provide information focused on the study's research questions and anticipated objectives (Padgett, 2012). Additionally, Padgett (2012) noted that qualitative sampling does not characterize the whole population but rather assists academic and hypothetical purposes. It was estimated that 30 interviews, 15 from each group, would be needed. The target organization granted approval for the researcher to contact and interview 35 associates, although the final number was determined when saturation was deemed met. After the seventh Scrum Master interview, the researcher felt saturation had been reached. Concerning the remote team members, saturation occurred after the fourth interview. There was a minimal deviation in the responses from the remote team members. After the seventh Scrum Master and fourth remote team member interview, the researcher confirmed no additional themes or experiences had been identified, and the data were determined to be redundant. Data collection ceased after these interviews. Noted redundancies were defined in both codes and meanings after the eleventh interview, which aligned with other qualitative studies reaching saturation often occurs by 12 participants (Boddy, 2016; Fusch & Ness, 2015; Guest et al., 2020). After the data collection and a review of the data, the researcher was confident that saturation had been achieved for this study.
Triangulation occurs when multiple data sources are used to identify codes and themes (Creswell & Poth, 2018). Stake (2010) supported the importance of triangulation by indicating triangulation is crucial to improving the confidence of the results. Triangulation is used to confirm and validate the data, with some data requiring more substantiation than others (Stake, 2010). In-depth triangulation is required where individual interpretation is stated. For instance, facts such as years of experience, training classes, and certification need less confirmation than the participants' viewpoints or perceptions (Stake, 2010). Therefore, member checking was incorporated throughout the interviews. The researcher audio recorded each interview and took written notes. During the interviews, the researcher validated statements, clarifying, correcting, or adjusting the participants' comments and meanings. After each interview, the transcript and the investigator's notes were provided to each participant for review and correction. Several participants verbally confirmed their agreement to the researcher's understanding stating, “Yes,” “correct,” or “absolutely” during the interviews. None of the participants changed or added content during their review of the transcripts with the researcher’s notes.

All interviews were audio-recorded. Each interview was listened to multiple times, verifying the recording, creating the transcripts, and several times during data analysis. The findings from the interviews were deemed accurate and valid due to the various verification methods, member checking, and repeated transcript examination and analysis. Additionally, the written transcripts were analyzed during the coding numerous times to understand and validate the data and meanings. References to all study participants are included in the presentation of findings.
Relationship of the Findings

Relationship to Conceptual Framework. The conceptual framework shown in Figure 1 is closely tied to the theme of Scrum Master leadership and management styles, with meaningful influence from the themes discussing Scrum Master skills, characteristics, behaviors, and actions. The organizational strategy determines how leadership and management theories are applied. Kotter (2014) indicated that as organizations mature and grow, adaptability is replaced with bureaucracy frequently administered in a hierarchical top-down approach limiting Agile benefits. The application of transformational leadership and related management theories helps blend creativity, innovation, and the necessary employee empowerment that support Agility (Kotter, 2014). Without the inclusion of leadership and management theories, this study would have been incomplete.

The conceptual framework shows that control theory is the fulcrum supporting leadership and management theory. Control theory underscores the Agile necessity to balance formal and informal control, avoiding rigid top-down structures and enabling empowerment and innovation. Control theory is another focal point of the study linked to Scrum Master behaviors, actions, skills, and characteristics. Control theory is the groundwork for the observations, perceptions, and experiences team members have with their Scrum Master(s) and led to the new knowledge derived from this research.

The four remaining theories, change management, stakeholder theory, constraints, and project management theory, are identifiable in project environments. As secondary influences, these theories intuitively support corporate strategy. The Scrum Master’s ability to harness the objectives and nuances of these theories aids in defining the project culture, interaction, and collaboration perspectives.
**Relationship to Research Questions.** There were three main research questions considered in this study. The central question was, why do Scrum Masters fail to engage regional team members in daily stand-up meetings and sprint planning meetings? This question was directly addressed in theme five, Experience of Scrum Master Interaction and Engagement with Remote Team. One hundred percent (100%) of the participants interviewed for the study agreed all team members with active use cases should be involved in all meetings. If unavailable, there should be a continuous communication loop. The team members indicated trained Scrum Masters organized and conducted valuable meetings, and typically all team members attended. The findings suggest that untrained Scrum Masters do not adhere to Agile principles or the designated framework leading to lengthy, unproductive, and confusing meetings. Knowledge and adherence to Agile methodologies were key findings of the study. Figure 10 indicates the references coded by a participant in regard to the importance of including all team members. Those with less Agile experience, such as SCM2 and SCM1, who are not Agile certified, placed less emphasis on including all team members in all meetings. Refer to Figures 12 and 14. Further research should be conducted to garner support for this claim.

Research question two, which asks about team member perceptions of Scrum Master engagement during the meetings, is supported by two sub-questions. Themes one, two, and to some extent, theme three help form an answer to RQ2. The prevailing consensus of Scrum Master engagement during meetings conveys that a proficient Scrum Master will organize and influence the meetings but let the discussion flow based on team member contribution and feedback. The overall sentiment of the Scrum Masters’ was they are team enablers, allowing the Agile framework to support the unique characteristics of the team and the team members, whether co-located or globally distributed, to self-organize and collaborate, driving value for the
customer during each sprint. While Scrum Masters are not project or team managers per se, team members interviewed indicated the need for Scrum Masters to display competency in management soft skills such as reading body language, communication, and cultural and personality differences. Additionally, the soft skill requirement was noted by the Scrum Masters, citing a need for emotional intelligence, empathy, and organizational behavior.

The underlying questions to RQ2 were based on perceptions of supportive and unsupportive actions and behaviors displayed by Scrum Masters. Theme four, Perception of Scrum Master Behaviors and Actions, discussed and reviewed this topic in depth. The results of this theme indicate that team members and Scrum Masters agree that flexibility is required, both in dealing with the individual team members and applying Agile concepts and the framework. The findings of this study support previous studies that indicate Scrum Master behaviors and engagement practices impact team coordination, communication, and collaboration. Figure 8 shows the word cloud created from the interview discussions about supportive Scrum Master activities and performance. Scrum Masters that were fully engaged with their teams displayed actions and behaviors regarded as communicative, collaborative, flexible, and open-minded. Unsupportive Scrum Masters appeared to have less experience, backgrounds other than Agile or displayed caustic or militaristic personalities. See Figure 9 for the word cloud exhibiting unsupportive actions and behaviors as communicated by the study participants.

RQ3 reviewed how the Scrum Master described the remote team members' experiences, interactions, and expectations. Theme five directly addressed the experiences study members had in exchange with their team counterparts, either the Scrum Master or team members. One hundred percent (100%) of interview participants agreed that all team members should be invited to Sprint meetings, planning, daily, or retrospectively. Figures 10 and 11 show the prominence
placed on engagement between the two parties. Everyone needs to have access to and share the same information and participate and communicate. The differences in answers appeared to stem from the project backgrounds of the participants. Those new to Agile or from Waterfall backgrounds spoke less about engagement and used more manager-type language when describing interaction experiences with the team members.

Theme six provided ancillary support to the research questions aiding the research by indicating the training backgrounds of all participants and where current expertise resides. Understanding project methodologies and the differences between the approaches, when to use each, and how to apply principles and practices is significant to the success of the team and the project.

**Relationship to Previous Studies and Anticipated Themes.** The findings of this study are analogous to those examined in the literature review and anticipated themes. Srivastava and Jain (2017) suggested Scrum Masters are required to personalize encouragement, motivation, and inspiration to engage individual team members fully. The word clouds in Figures 5 and 8 support this claim, identifying such rich text as support, team, priorities, framework, leadership, and ownership. In studies by Holzmann and Panizel (2013) and Yagüe et al. (2016), communication and collaboration were found to be the building blocks of thriving Agile environments. Multiple times in the interviews, the participants indicated successful and respected Scrum Masters foster interaction and teamwork within their Agile teams. Deemed just as necessary was the Scrum Master’s ability to recognize individual strengths and traits to promote and encourage team member interaction and exchanges. A concern raised by Srivastava and Jain (2017) suggested that remote team members can miss the subtleties of body language and tones, impacting understanding of prerequisites or concerns. The Scrum Masters interviewed
acknowledged the difficulty of dealing with fully remote teams when COVID-19 forced everyone from the office. However, most indicated that remote team members are not new and are frequently used within the target organization. Roughly 75% of the projects discussed during the interviews included geographically distant team members. Figure 10 reinforces the idea that all team members, whether co-located or geographically distributed, are essential for all sprint meetings.

Dreesen et al. (2016) and Qureshi et al. (2018) found that poor communication and collaboration with remote team members contribute to failed projects. The current study reinforced this assertion with the rich text and comments regarding all member inclusion, see Figures 10 and 11. Additionally, while not feasible during the pandemic, periodic face-to-face meetings were deemed instrumental in forming relationships and working methods among the teams. In all interviews, the words communication and collaboration were used collectively over 400 times.

Additionally, Usman et al. (2016) maintained that the Scrum Master is the facilitator for team empowerment and the enabler for team development and success. The extant literature had indicated numerous times that the Scrum Master removes blockers and obstacles to the team progression and achievements. The interviews for this case study recorded the opinion of all participants, with consensus identifying the value of team members being included in all sprint meetings. Furthermore, several Scrum Master interviews indicated an affinity to coach or emotionally support team members to increase team synergy.

Understanding the Agile framework and methodology stood out among many responses. As revealed in the literature review, the benefits of using an Agile framework can result in increased team satisfaction, motivation, and improved quality and value provided to the
customer. The ability to finesse the Agile framework to support and organize the team in a way suited to enable and empower a cohesive and robust group. This claim was supported by the study findings, as indicated by the rich and detailed descriptions and perceptions of team members and Scrum Masters discussing team dynamics (See Figure 5).

The quotes from the study participants and the visual representation of the data aligned with the predicted results. For the most part, the anticipated themes developed during the data analysis phase. Definition of sprint success was predominately based on providing value to the customer during each interval. Although participants described value to the customer in different ways, meeting the definition of done, handing over for testing, or bringing satisfaction to the team members, a successful sprint is when all those items have been accomplished, and the customer sees progress.

A final theme that emerged from this study was the training and certification of the participants. This theme had not been previously reviewed and is not directly supported by the literature review. However, the findings suggest that Agile training is fundamental to both participant groups, weighing heavily on comprehension and application of the Agile principles and framework. Without Agile training, sprint meetings were disorganized, lengthy, and non-value add. Furthermore, the need for certification is inconclusive. Additional research is required to validate any further results.

**Summary of the Findings**

The target organization is undergoing a digital transformation that involves re-organizing the IT departments and focusing on Agile methodologies and practices enterprise-wide. While changing the course of such a large organization is daunting and lengthy, this study points out important areas for change and improvement. Five anticipated themes were identified via the
literature review. The themes were leadership and management styles, Scrum Master skills and characteristics, actions and behaviors, sprint success, and Scrum Master engagement. These five themes plus a sixth one were identified during the research and data analysis. The final theme of education and certification was revealed during the data analysis and correlated to the knowledge of the Agile framework and necessary skills. The data were displayed visually using graphs and word clouds to reflect the findings.

Many influencing factors impact project productivities, including team interaction, communication, and the number of deliverables. Based on the study findings, a successful Scrum Master is candid, honest, and focused on building relationships. They put people first, lead by example, are approachable, open to ideas and suggestions, and champion the team.

Transformational leadership: influencing the Scrum Master’s leadership style and training impacted team engagement and motivation. The data showed that the participants emphasized communication and management soft skills to guide and support the team through each sprint and ultimately provide value to stakeholders and customers. Although training and certification were not extensively discussed in the literature review, the study results suggest that Agile training is significant to the Scrum Master’s actions and behaviors and the team’s engagement practices. Both saturation and triangulation were discussed. Finally, a review of the findings related to the conceptual framework, research questions, and the extant literature was presented.

Application to Professional Practice

Prior to this study, the researcher determined a gap in the literature. Using the disparity in previous research, this study was initiated to add to the project management body of knowledge. The researcher identified several aspects of the study that can be applied to professional practice.
Scrum Master skills and characteristics, training and education, and actions and behaviors are specific themes that will be reviewed regarding application to practice in this section.

**Improving General Business Practice.** The first application was Scrum Master skills and characteristics. The findings from the study suggest that Scrum Masters require basic soft skills to organize and facilitate team collaboration and activities. Lack of soft skill training or inadequate training impacts leadership abilities by impairing communication and teamwork skills. Based on the literature review and the participant's responses, the Scrum Master requires specific skills to influence the environment, culture, and team collaboration efforts (SCM3; SCM4; Kotter, 2014). As explained in various interviews, people skills aid project leaders in motivating and influencing team members' actions, behaviors, and customer-impacting decisions (RTM3; SCM4). Agile projects' people-centric premise emphasizes quick and repetitive social interactions between all team members (Gupta et al., 2019). This issue relates to professional practice as it directly impacts the recurring social and technical engagement that applies to project achievement and Scrum Master success.

The second application to practice was the training and education of the Scrum Master, which assists the team in learning and following the Agile methodology. In the literature review, Moe et al. (2012) and the study participants (SCM1; SCM3) indicated the benefits of understanding and utilizing the Agile framework. As indicated by SCM1, the Scrum Master must understand the values and ideology structuring Agile projects to support and train the team effectively. Without comprehensive Agile knowledge, individuals placed in the position of Scrum Master caused impediments and uncertainty, wreaking havoc on team dynamics and project headway (RTM4). Study participants indicated the requirement for Scrum Masters and team members to understand Agile project methodology (SCM1; RTM4). While 91% of the
participants had some level of Agile training, those with external training appeared to comprehend subtle nuances of Agile philosophy that accounted for advanced ideation and flexibility in the application (SCM6; SCM7). These findings pertain to professional practice by identifying points lacking in company-provided training. The expertise of Scrum Masters with only in-house training appeared to be limited. Only 55% of the participants had external training (Figure 13), and Scrum Masters, on average, only had 3.5 years of experience, revealing a potential need to provide additional training and coaching. Knowledge of Agile principles and practices reduced frustration and inefficiency while improving flexibility, collaboration, and cohesiveness (Azanha et al., 2017). In addition to Scrum Master's adeptness in people and communication skills, organizations should vet Scrum Masters with the necessary capabilities and provide appropriate training to team members to facilitate an easy and smooth start to projects. Using the study results can aid Scrum Masters and their organizations in recognizing areas to focus training and placement efforts when staffing projects.

The last dominant application was related to Scrum Master actions and behaviors. Although the themes exposed in this study tend to converge on the training, skills, and conduct of high-performing Scrum Masters, the style and technique used to engage and finesse team coordination and collaboration is a crucial aspect of Agile and self-organized teams. Loiro et al. (2019) found that many teams are ill-prepared to address the significant differences in organizational behaviors and cultural shifts between Agile and traditional project methodologies. One of the most challenging tasks in Agile projects is forming and norming the project team. According to Rigby et al. (2016), leadership must have a thorough understanding of Agile and the differences compared to traditional methods to avoid ingrained management practices that subvert and obstruct the foundation of Agile principles. Reflected in several of the interviews
(RTM3; RTM4; SCM4) and displayed in Figures 8 and 9, there are specific behaviors and actions Scrum Masters can take to support and enable the team in this transition. While self-organized teams are challenging to establish and leverage their advantages the project teams' ability to communicate among themselves and the various stakeholders demands Scrum Master's commitment, governance, and observation to promote steady development and progress (Rigby et al., 2016). Furthermore, as Wong and Berntzen (2019) indicated, contemporary leadership theories focus on providing a clear vision with the leadership ability to communicate that vision and provide a structure for team acceptance, acknowledgment of expectations, and intellectual engagement. The results of this study indicate that the actions and behaviors of the Scrum Master impact the project team's environment, culture, and adaptation to Agile practices and methodologies.

**Potential Application Strategies.** The section will consider the value this case study offers and the possible impact on IT projects in the manufacturing industry. The discussion will incorporate how this study can advance general business practices to improve the productivity and effectiveness of Agile project teams. Lastly, potential implementation approaches that IT organizations can use to leverage the results of this study will be presented.

The findings in this study can influence how IT organizations address strategic training topics to promote the adaption of Agile methodologies overall and, specifically, critical training for Scrum Masters and Agile team members. The results of this study have increased awareness of Agile training and skill inconsistencies and how those topics impact team productivity and effectiveness within the target organization. There are numerous considerations to account for when implementing Agile. Boehm and Turner (2005) suggested that the challenge of implementing Agile practices is frequently in direct conflict with current business processes. An
Agile transformation challenges focusing on long-term goals and definition of project key performance indicators (Cooper & Sommer, 2018). Additionally, due to the iterative, short-term approach to value creation instead of milestone achievements tracked by budget, Agile requires strong upper management support, leadership experience, and commitment to pursuing an organizational change to this innovative frame of mind (Cooper & Sommer, 2019). Kumar and Shankar (2016) indicated that Agile endeavors tend to lose focus and direction without experienced leaders and management support from all levels.

Some general business practices this study can impact are in the area of strategic training. Overall the target organization for this study is involved in an Agile transformation. Moreover, while many of the topics discussed in the study could generally apply to numerous business divisions and departments, the focus is on the IT organization and handling customer-driven requirements addressed in Agile Projects.

The first point emphasizes the value of Agile training and encourages departmental leaders and mid-level managers to understand the concept and support its spread throughout the organization, not just IT. While Agile remains a relatively new concept, rollout at the target organization is slow to adapt, with some departments hesitant to change. Participants (SCM2, SCM4) noted that reluctance and misalignment of project methodologies are frustrating to working team members, reducing collaboration, morale, and progress. Likewise, if both sides of the team, IT and customer, use the same project methodology, communication, transparency, and goals are aligned and understood.

Secondly, while remote work due to COVID-19 has significantly reduced the amount of travel required for many IT associates, the downfall is that associates cannot easily connect with their teammates. Several study participants noted the benefits of the opportunity to meet
colleagues face to face, indicating that it creates a quick and tighter bond among team members (SCM4; RTM4). While the organization has become quite adept and innovative at hosting remote team-building activities, the meetings infrequently directly address the project methodology. This information conveys that project leaders need to consider addressing the project methodology; specifically, Agile where used.

The next application strategy considers the range, frequency, and breadth of Agile training. While some study participants opted out of company-provided Agile training, the majority, 73% of participants and 71% of the Scrum Masters, attended the in-house training and found it beneficial to understanding and working on an Agile project. However, as noted by RTM4, not all Scrum Master or team members are trained prior to being placed in their roles, causing frustration, disorganization, and delays in the team forming. Scrum Masters should receive training before being placed in this critical position. Leadership could even consider shadowing experienced Scrum Masters as part of the onboarding processes for new Scrum Masters. The data from this study shows that once the Scrum Master understands and applies Agile practices and supports the team's learning and acclimatization to Agile, the team is effective and productive.

Summary

Switching from traditional project approaches to an Agile framework is challenging at best. This study provided an overview of the criticality of training and experience of Scrum Masters and their Agile teams. The findings provide an overview of potential improvement and areas of consideration for leadership. Highlighting a strategic training plan in Agile methodologies suggests the possibility of proper role assignment, increased satisfaction, and
team morale. Furthermore, the Scrum Master's knowledge, experience, and skills aid in the team building lifecycle, team engagement, and team environment and culture.

**Recommendations for Further Study**

The findings addressed the main research questions posed in the study. However, several responses were raised during the investigation that warrants further exploration. Several of the study participants questioned processes outside of North America. Although the researcher was only approved to discuss the topic with select departments in North America, the target corporation is an international manufacturer with an extensive global IT organization. A larger study involving the European and Asian regions would be exciting and shed additional light on Scrum Master engagement. Europe, Asia, and the Americas, all three major areas, are spread out globally and potentially have some operating differences. A study into the differences between the regions could aid in the identification of best practices or necessary changes. Furthermore, it would be interesting to study the cultural differences between each region and how it impacts an Agile team.

While Agile projects using Scrum Master's is trendy throughout the industry, there are other types of Agile approaches, for example, Kanban and lean. Lei et al. (2017) stated that an Agile Kanban approach attempts to prioritize the demand, stressing a just-in-time point of view. A Kanban approach can provide visibility to the team and transparency to stakeholders via the Kanban board. Kniberg and Skarin (2009) commented that Kanban and Scrum are similar in approach and often used together in projects. This is true is also true for the target organization. As a further point of the investigation, it would be interesting to conduct a similar study on how many projects use a combination of the two approaches, specifically looking into the team and leadership make-up. A primary thought would be to explore the lack of roles in Kanban versus
the structure provided by Scrum, using such roles as the Scrum Master and Product Owner. Likewise, a complete study would be required to determine the appropriate circumstances for using Lean versus Agile. Both philosophies can be used with different frameworks, such as Scrum. A multi-case study would perhaps offer insight into the perceptions of various teams.

Lastly, it would be interesting to extend this study to include input from the customer's point of view and investigate how customer expectations are managed and the interdependency of the customer requirement and acceptance criteria to the development team's comprehension of those requirements and how they form the product requirements. From this perspective, it could also be interesting to explore how often the requirements change after hand over to development and how this impacts sprint planning.

**Reflections**

After presenting the research findings, the researcher reflected on the study and the involved subordinate processes. Several aspects that impacted the researcher’s professional and personal growth were identified. Furthermore, the study findings were considered through a biblical lens, manifesting integration with a Christian worldview. The researcher will discuss these reflections in the next section.

**Personal and Professional Growth**

Conducting this research project was a long-term goal and fostered professional and personal growth. The entire process was a learning journey that started with the prerequisite classes. Before beginning the dissertation phase, the required coursework helped hone and define the topic selection. While the entire process was new, the literature review provided an in-depth investigation that enhanced comprehension of the topic and expanded familiarity with supporting
concepts. The information gleaned during the literature review aided the researcher in developing purposeful interview questions.

Both the IRB and the target organization’s approval processes were eye-opening. The requirements, documentation, and time to gain the approvals to conduct the study were frustrating and particularized. Perhaps the most challenging part of the investigation was lining up the participant interviews. Many associates did not have the necessary background to qualify for the study, and many seemed uninterested. In hindsight offering a small incentive may have reduced the reluctance to participate. However, the interviews were enthralling. The participants were open to discussion, honest in sharing opinions, and provided vivid examples.

Conducting all approval requirements, research, and interviews was relatively easy for the researcher. Having prior knowledge and experience with Teams and other applications in the Microsoft Suite provided an advantage to the researcher. Conversely, the researcher had little experience with NVivo, which delayed the analysis of the data and, at one point, required restarting with a new project in NVivo to organize better and code the data. There was much personal growth during this phase of the project. The researcher gained proficiency in the technical aspects of NVivo and understood the various tools used to analyze and evaluate the data.

From a professional perspective, the researcher deeply investigated a topic of significant interest personally and to the target organization. Although the researcher is employed at the target organization in a similar capacity, interviewing associates from various departments helped formulate an understanding of Agile project management's maturity level throughout North America. Furthermore, the study identified concepts of interest and areas of improvement that can be applied. Boehm and Turner (2005) indicated that implementing Agile practices is
challenging. The data collected and the resulting analysis, in addition to the researcher's own experience, support this statement. It is the hope of this researcher that the findings of this study can be used to propel the organization to change and new heights of Agile awareness and implementation.

*Biblical Perspective*

Each of the emergent themes correlates to biblical beliefs, ensuring a comprehensive overview and Christian worldview of the study. The first theme, sprint success, is discussed at various points throughout both the old and new testaments. Proverbs 21:30 indicates, "There is no wisdom and no understanding and no counsel against the Lord (New American Standard Bible, 1960/1995). Trust in God's plan, and he will support you and guide you. 1 Samuel 2:3 also supports the Scrum Master and team in achieving sprint success, "Boast no more so very proudly, do not let arrogance come out of your mouth; for the Lord is a God of knowledge, and with Him, actions are weighed" (New American Standard Bible, 1960/1995). Sole individuals do not accomplish project or sprint success, but a team of people that work together, sharing knowledge, experience, and championship. Many team members look to the Scrum Master for guidance and support, and Scripture offers many instances of encouragement. "If your brother becomes destitute and cannot sustain himself among you, you are to support him as a foreigner or temporary resident so that he can continue to live among you" (New American Standard Bible, Lev. 25:35). The Leviticus passage instructs Scrum Masters and team members to support and lift their colleagues and provide kindness and concern for all team members.

Building and supporting the team is also accomplished by training and education. Leader knowledge can be a challenge in implementing Agile practices. Many study participants relayed the importance of a Scrum Master's understanding of the basic Agile principles and methods to
guide the team adequately. Psalms 18:33 (New International Version, 1973/2011) indicates this concept, "He gives me the agility of a deer; he enables me to negotiate the rugged terrain." The Lord supports his followers, helping them learn to rise and meet their challenges.

Similarly, the Scrum Master must have the experience and knowledge to aid the project team in the same manner. The team looks to the Scrum Master for assistance in understanding and applying Agile concepts. Program management must recruit a Scrum Master that reinforces Agile methodologies with proper training and preparation for the role. However, ownership does not rest solely with the Scrum Master; the Bible speaks to each team member "Do not merely listen to the word, and so deceive yourselves. Do what it says" (New International Version, 1973/2011, James 1:22). The Lord instructs man to work in Genesis 1:28-30, which is supported by Keller and Alsdorf (2012) that leaders must understand the purpose of work and how it influences those around them in the organization. Putting forth the effort to learn, apply, and adjust Agile principles and values from program management to individual team members fosters a working environment supporting the team's needs. As noted by several study participants, the ability to flexibly apply Agile methods and principles was key to building a performing team (SCM6; SCM7).

Additionally, number 1 in the Agile Manifesto, "Associates and their exchanges take precedence over procedures and tools." Romans 12:2 (English Standard Version, 2001/2016) spoke well to this concept, "Do not be conformed to this world, but be transformed by the renewal of your mind, that by testing you may discern what the will of God is, what is good and acceptable and perfect." While the Lord urges Christians to not conform to the savage world, be of the world. Scrum Masters must understand the entire Agile framework yet apply specific points and concepts appropriate for the team. The Roman verse further encourages a renewal of
the mind, suggesting that transformation of thinking will fundamentally change a Christian's ability to work with an improved understanding of God's will. Therefore, work will be aided by walking through life with Christ. It is this self-efficacy that leaders should possess to support the team and conquer Agile challenges. "But as for you, teach what accords with sound doctrine" (English Standard Version, 2001/2016, Titus 2:1).

Other themes that emerged during the study centered on the Scrum Master's leadership approach and behaviors. Several interviewees expressed the need for the Scrum Master to coach, enable, and empower the Agile team (RTM4; SCM6; SCM7). "Let no one despise you for your youth, but set the believers an example in speech, in conduct, in love, in faith, in purity" (English Standard Version, 2001/2016, 1 Tim. 4:12). Regardless of age, this passage applies to all leaders. Throughout the Book of Timothy, Paul challenges Timothy to lead by example. Christian leaders should use words, actions, love, and faith in their position, encouraging effective spiritual behavior (English Standard Version, 2001/2016, 1 Tim. 1:5, 2:15, 5:2). Linked to leadership style, the behavior of the Scrum Master was highly noted by participants. Compassion was repeated throughout the interviews as a dominant supportive Scrum Master behavior (SCM2; SCM6; RTM3; RTM4). "But the fruit of the Spirit is love, joy, peace, patience, kindness, goodness, faithfulness, gentleness, self-control; against such things, there is no law" (English Standard Version, 2001/2016, Gal. 5:22-23). Christians that have received the gift of the Holy Spirit are born again, essentially becoming a new person with the Spirit of Christ inside. Depending on how close each Christian is to Christ and how much of his word is spread, this Spirit is cultivated and blossoms into the fruits of the Spirit. The cultivation of these fruits that aid team leadership and behaviors follow and support a Christian Worldview. "Wherefore by their fruits you shall know them" (English Standard Version, 2001/2016, Matt. 7:20).
Summary

This research was executed as a flexible, single-case study design. Data were collected via various methods allowing for triangulation of the results wherein the data validated the findings. Six prominent themes emerged during data analysis (See Table 3). Data supported the themes regarding study participant quotes, relation to the extant literature, the conceptual framework, and the research questions. Scrum Masters, well versed and experienced in Agile methodologies, appeared to aid team understanding and organization. Additionally, Scrum Masters’ behaviors and actions, particularly those related to soft skills such as interpersonal skills, communication, and team management, seemed to improve the team setting and culture.

The study ended with a section of reflections, which covered the researcher’s personal and professional growth. Knowledge of the Microsoft Suite of Office Products aided the researcher in preparing, scheduling, conducting, and recording the interviews. The NVivo software was a learning experience, and the investigator realized growth and understanding of that specific software. Overall, the researcher was inspired to delve deeply into Agile Project Management and the entire research process. Experiencing the academic foundation of research methods and designs enabled an understanding of the importance of defining the research problem, developing the appropriate research questions, and preparing for and executing interviews with the selected participants. Lastly, from a Christian worldview perspective, the themes of sprint success, training, leadership, and behavior were discussed. In reference to biblical principles, this further explored the study data.
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Appendix A: Interview Questions (scrum masters)

(Includes primary question and follow-up questions to facilitate discussion)

1. How many years have you been performing this role?
   a. What role were you in before taking on the scrum master?
   b. Why did you decide to become a scrum master?

2. Discuss what education or training you have related to this role?
   a. Internal company training?
   b. Industry-related courses, PMI?
      i. Are you an Agile Certified Professional?
      ii. If so, when did you receive your certification
      iii. Do you maintain the certification?
   c. University or College coursework?

3. What is your definition of sprint success? Discuss the completion of user stories, customer feedback, and retrospectives.

4. How does your role as scrum master support sprint success?

5. What is your leadership style? How does that impact your agile projects, specifically communication, engagement, and interaction with your team?

6. What is your management style? How does that impact your agile projects, specifically communication, engagement, and interaction with your team?

7. What are the characteristics you deem necessary for a scrum master to foster team engagement and adherence to sprint commitments?

8. What are the skills you deem necessary for a scrum master to foster team engagement and adherence to sprint commitments?

9. Explain the makeup of your current team.
a. On-site vs. remote team members

b. Language skills

c. Were past teams similar? If no, what changed? Why?

10. Explain the daily stand-up meeting.

   a. What time is it held?

   b. Who attends? Remote team members?

   c. Different time zones?

   d. Does the meeting ever change time? Why or why not?

   e. Do you speak English during the meetings?

11. Are remote team members included in sprint planning and retrospective meetings? What are the benefits? If not, why?

12. What is the average number of user stories completed per team member during a sprint?

   a. How are user stories assigned?

13. Do you see a difference in user story completions or the number of user stories per sprint between on-site team members and remote team members?

   a. If there is a difference, can you explain why it occurs?

   b. If there is a difference, how do you manage it and explain it to the customer?

14. Is there a benefit to including remote team members in the group? Why?

15. Do you see a difference in the way you handle scrum master responsibilities compared to your colleagues? If yes, in what way?

16. Do you group remote team members differently than those on-site?

   a. For instance, the core team vs. extended core team? If yes, why?

17. Do your expectations of remote team members differ from on-site team members?
18. Do you engage or interact with remote team members differently than you do on-site team members?

19. Are there any skills you would like to learn or improve to be a better scrum master?

   (technical skills, soft skills, management, leadership)
   
   a. Do you see this need across the organization?
   
   b. How could those skills be developed?
   
   a. methods)
Appendix B: Interview Questions (distributed team members)

(Includes primary question and follow-up questions to facilitate discussion)

1. How many years have you been performing this role?
   a. What role were you in before joining?

2. Discuss what education or training you have related to this role?
   a. Internal company training?
   b. Industry-related courses?
   c. University or College coursework?

3. What is your definition of sprint success? Discuss the completion of user stories, customer feedback, and retrospectives.

4. How does the scrum master support sprint success?

5. What is your scrum master's leadership style? How does that impact your agile projects, specifically communication, engagement, and interaction with the scrum master?

6. What is your scrum master's management style? How does that impact your agile projects, specifically communication, engagement, and interaction with the scrum master?

7. What are the characteristics you deem necessary for a scrum master to foster team engagement and adherence to sprint commitments?

8. What are the skills you deem necessary for a scrum master to foster team engagement and adherence to sprint commitments?

9. Explain the makeup of your current team.
   a. On-site vs. remote team members
   b. Language skills
   c. Were past teams similar? If no, what changed? Why?
10. Explain the daily stand-up meeting.
   a. What time is it held?
   b. Who attends?
   c. Do you attend?
   d. Different time zones?
   e. Does the meeting ever change time? Why or why not?
   f. Do you speak English during the meetings?

11. Are remote team members included in sprint planning and retrospective meetings? If yes, what are the benefits? If not, why?

12. What is the average number of user stories completed per team member during a sprint?
   a. How are user stories assigned?
   b. Does the scrum master interact with you outside of defined meetings?

13. Do you see a difference in how the scrum master engages remote team members compared to on-site team members? If yes, in what way?

14. Are you grouped differently than on-site team members?
   a. For instance, the core team vs. extended core team? How does that make you feel? Why?

15. Does the scrum master have different expectations of remote team members compared to on-site team members? If so, why?

16. How often do you engage or interact with the scrum master?
   a. Does this interaction occur during a meeting? If no, why does this happen? Do you feel it is extra work for you to understand the conference calls or instructions?
   b. Are other team members involved? If yes, is there a specific reason?
17. What skills should the scrum master possess to help you complete more user stories?

18. What scrum master behaviors or actions are most beneficial to you as a remote team member?

19. What scrum master behaviors or actions are unsupportive to you as a remote team member?
## Appendix C: Project Word Frequency Chart

<table>
<thead>
<tr>
<th>Word</th>
<th>Count</th>
<th>Weighted Percentage (%)</th>
<th>Similar Words</th>
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<td>2.81</td>
<td>team, teams</td>
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<td>1.14</td>
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<td>0.89</td>
<td>time, timed, timely, times, timing, timings</td>
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<td>450</td>
<td>0.83</td>
<td>differ, difference, differences, different, differently</td>
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<tr>
<td>sprint</td>
<td>425</td>
<td>0.78</td>
<td>sprint, sprints</td>
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