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Strategies for Attracting and Retaining Highly Skilled IT Professionals for the High-Tech Workforce

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Walden University

College of Management and Technology

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Mia Moore

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

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Walden University
2022

Abstract

Strategies for Attracting and Retaining Highly Skilled IT Professionals for the High-Tech

Workforce

by

Mia G. Moore

MS, Walden University, 2017

MS, Georgia State University, 2002

MS, Clark Atlanta University, 1994

BS, Morris Brown College, 1991

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Information Technology

Walden University

April 2022

Abstract

Many information technology (IT) managers have experienced challenges retaining high-tech professionals. Organization leaders lose investments of time and money when essential personnel leave. Grounded in the task-technology fit theory and the technology acceptance model, the purpose of this qualitative multiple-case study was to explore technology-focused strategies IT managers use to attract and retain IT professionals. The participants included five IT managers from five high-tech organizations who implemented strategies to attract and retain IT professionals. Data were collected from semistructured interviews and online resources. Thematic analysis revealed four themes: (a) using high-tech tools and alternative methods, (b) employing talent management techniques, (c) amplifying organizational culture, and (d) safeguarding employee well-being. A key recommendation is that IT managers use technology-based tools such as social networking sites, employment websites, employment search engines, employer-review websites, and e-learning platforms to gain global access, form connections, and build relationships with potential candidates. The implications for positive social change include the potential to contribute to the economic growth of local communities and expand the global reach of organizations.

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Dedication

I dedicate my doctoral study to my Lord and Savior, Jesus Christ. The Lord guided, strengthened, and stood with me throughout this rigorous process. I am eternally grateful for His presence in my life. I also dedicate this study to my family. My husband, Lorenzo J. Moore, has been my constant supporter throughout my academic quests. His sacrifices for me have been countless, and I am thankful for his love. My children, Jevori, Javien, Jazmyne, and my late daughter, Joya, are sources of inspiration. I started this journey to demonstrate that all things are possible with God. The reassurance from my in-laws, Alonzo and Norma Moore, aunts, uncles, cousins, and friends is what I needed to keep advancing.

The prayers and life-affirming foundation established for me by my late loved ones—my parents, Seabron and Sandra Profit; my paternal grandparents, Rev. Henry Crimes and Mrs. Margaret Davis Crimes; and my maternal grandmother, Mrs. Doris Edwards Atkinson—have directed my life and propelled me to heights that I could not have reached on my own. I am grateful for their love and instruction.

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I want to thank the dynamic Atlanta University Center Consortium (AUCC) for planting the seed of potentiality and providing me with the tools to grow where planted. I am blessed to have completed two degrees within the AUCC. The idea to be more and do more was birthed at Morris Brown College and cultivated at Clark Atlanta University.

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Section 1: Foundation of the Study

Highly skilled information technology (IT) professionals are in demand in many industries. According to Obisi and Gbadamosi (2017), technological innovations are transforming the workforce and causing an escalated demand for skilled workers. The increasing rate of technological change has led to modifications in job tasks and rendered routine tasks obsolete (Deming, 2017). Jobs that require higher-level thinking skills are not as easy to replicate as jobs that involve repetitive tasks and require low-level skills. Therefore, strategies are needed to attract, retain, and develop IT professionals for the workforce, especially in high-tech industries.

Background of the Problem

Technological developments are affecting the global workforce. Over the past few decades, technical employment opportunities have grown, and projections indicate rapid increases over the next decade (Csorny, 2013). The increased demand for services produced by the IT industry has created a high demand for IT workers (Csorny, 2013). High-tech organizations account for 12% of employment within the United States, equating to 17 million workers within science, technology, engineering, and mathematics (STEM) occupations (Wolf & Terrell, 2016). The accelerated rate of technological advancements has caused an evolution in the skills needed by IT professionals (Kappelman et al., 2016). Technology has been a key driver of economic growth, and it has transformed the lives of corporations (Hessler, 2014). According to Hessler (2014), economic power is the aim of every organization, and employee retention is essential for organizations' successful performance (Cloutier et al., 2015). Therefore, high-tech

organizations must attract and retain highly skilled professionals to remain competitive (Chakrabarti & Guha, 2016).

U.S. organizations struggle, however, to attract and retain critical skilled and high-potential employees (Schramm, 2015). Implementing retention techniques will help organizations reap benefits and improve organizational performance (Premalatha, 2016). The focus of this study was on the strategies that IT managers use to attract and retain IT professionals to meet the needs of a technology-driven workforce.

Problem Statement

High-tech organizations face many challenges concerning attracting and retaining highly skilled professionals (Chakrabarti & Guha, 2016). The need for keeping high-tech employees is evident in the United States and India because both require these high-tech professionals for their domestic economies. The annual total separations rate in the U.S. information industry increased from 29.7% in 2013 to 35.0% in 2017 (Roberts & Wolf, 2018), whereas the annual national average of IT industry resignations is 10% to 15% in India (Saranya & Muthumani, 2015). Organizations lose investments of time and money when essential personnel leave (Choudhary, 2016). The general IT problem is that many organizations do not attract and retain professionals with the skills needed for high-tech industries. The specific IT problem is that some IT managers lack effective technology-focused strategies to attract and retain highly skilled IT professionals in a high-tech workforce.

Purpose Statement

The purpose of this qualitative multiple case study was to explore technology-focused strategies that IT managers used to attract and retain IT professionals to meet the needs of a technology-driven workforce. The study population was IT managers from at least four high-tech organizations in Atlanta, Georgia, who implemented strategies to attract and retain highly skilled IT professionals for the high-tech workforce. The findings of this study may promote social change by bolstering the economy in the local community by keeping IT professionals employed.

Nature of the Study

I chose the qualitative research approach to explore technology-focused strategies used by IT managers to attract and retain IT professionals for the high-tech workforce. Qualitative research is an in-depth exploration of a phenomenon in its natural context (Moser & Korstjens, 2017). The qualitative research method was appropriate because I conducted a comprehensive examination in a real-life setting of the study phenomenon, which was the practices of IT managers who have been effective in attracting and retaining IT professionals for the high-tech workforce. A quantitative approach was not suitable for this study because I explored the strategies used by IT managers in their natural setting. In quantitative research, numerical data is used to quantify a theory or a problem (McCusker & Gunaydin, 2015). The researcher did not select the quantitative research method because the collection of numerical data did not occur, and a quantitative approach was not warranted. Mixed-methods researchers combine quantitative and qualitative techniques, procedures, and strategies in a single study to add

reliability and significance to study outcomes (Ivankova & Wingo, 2018). I did not select the mixed-methods research method because there were no numerical factors to quantify in the study. Therefore, the chosen research method was qualitative research because answering the research question required in-depth exploration and did not necessitate analysis of statistical data.

A multiple-case study design was the appropriate design chosen for this study. A case study is an intensive study about a person, a group of people, or a thing or other entity, in which the researcher asks open-ended questions and examines in-depth data to gain insight and understanding of a phenomenon in the natural setting (Heale & Twycross, 2018). A multiple-case study design is appropriate when the use of more than one case will provide a better understanding of the phenomenon being investigated (Heale & Twycross, 2018). In this study, I selected five high-tech organizations in Atlanta, Georgia, to explore the many aspects of attraction and retention strategies used by IT managers in the United States. The multiple-case study design was, therefore, appropriate for this study. I considered ethnography and phenomenology for this study. The ethnographic researcher becomes a participant in the environment to understand the environment's culture, practices, and experiences (Simpson et al., 2014). I did not select ethnographic research because I did not become a participant in the setting during the study. The phenomenological researcher describes how humans experience a phenomenon (Sousa, 2014). The phenomenological approach was inappropriate for this study because I did not investigate the participants' experiences. I examined the strategies used to attract and retain highly skilled IT professionals. I chose the case study design,

specifically a multiple-case study design, because I wanted to conduct an in-depth investigation of the retention strategies used by IT managers in high-tech organizations in the United States.

Research Question

What technology-focused strategies do IT managers use to attract and retain highly skilled IT professionals in a high-tech workforce?

Interview/Survey Questions

1. What methods does your organization use to attract and retain highly skilled IT professionals?
2. How has the implementation of these methods impacted attracting and retaining IT professionals?
3. Which methods have had the most significant impact on attracting and retaining IT professionals in your workplace?
4. How would the increased use of techniques to attract and retain IT professionals impact your workplace?

Conceptual Framework

The two frameworks I used to inform this study were Goodhue's (1995) task-technology fit theory (TTF) and Davis' (1989) perceived usefulness (PU) component of the technology acceptance model (TAM). I used TIF and PU to explore the technology-focused strategies used to attract and retain high-tech professionals.

Task-Technology Fit Theory

Technology assists users in performing tasks. For this reason, Goodhue (1995) developed TTF to conceptualize how technology fits the needs of users performing tasks. According to Goodhue and Thompson (1995), a gap between task requirements and technology capabilities will negatively impact user performance. Furthermore, a fit between task, technology, and individual attitudes will lead to better performance (Goodhue & Thompson, 1995). I used the TTF theory to analyze employee retention strategies that capitalize on the implementation of best-suited technology. Performance impacts are witnessed when systems are used (Goodhue & Thompson, 1995).

Perceived Usefulness Component of the Technology Acceptance Model

Technology usage is a consideration when determining the effect on user performance. PU originated from Bandura's (1977) self-efficacy theory, which defines self-efficacy as an individual's belief in their ability to achieve goals. There is a connection between job self-efficacy, job performance, and job satisfaction (Rigotti et al., 2008). Individuals who have a high level of self-efficacy believe that they have the skills needed to successfully perform in their career. This self-confidence contributes to positive job performance and job satisfaction.

One of the primary strengths of the TAM resides in the predictive nature of the framework. Saadé and Bahli (2005) defined PU, an independent component of TAM, as the extent to which a user believes that utilizing a specific application will increase job performance. A system is high in PU when the user acknowledges a positive relationship between technology usage and job performance (Davis, 1989). External variables, such as

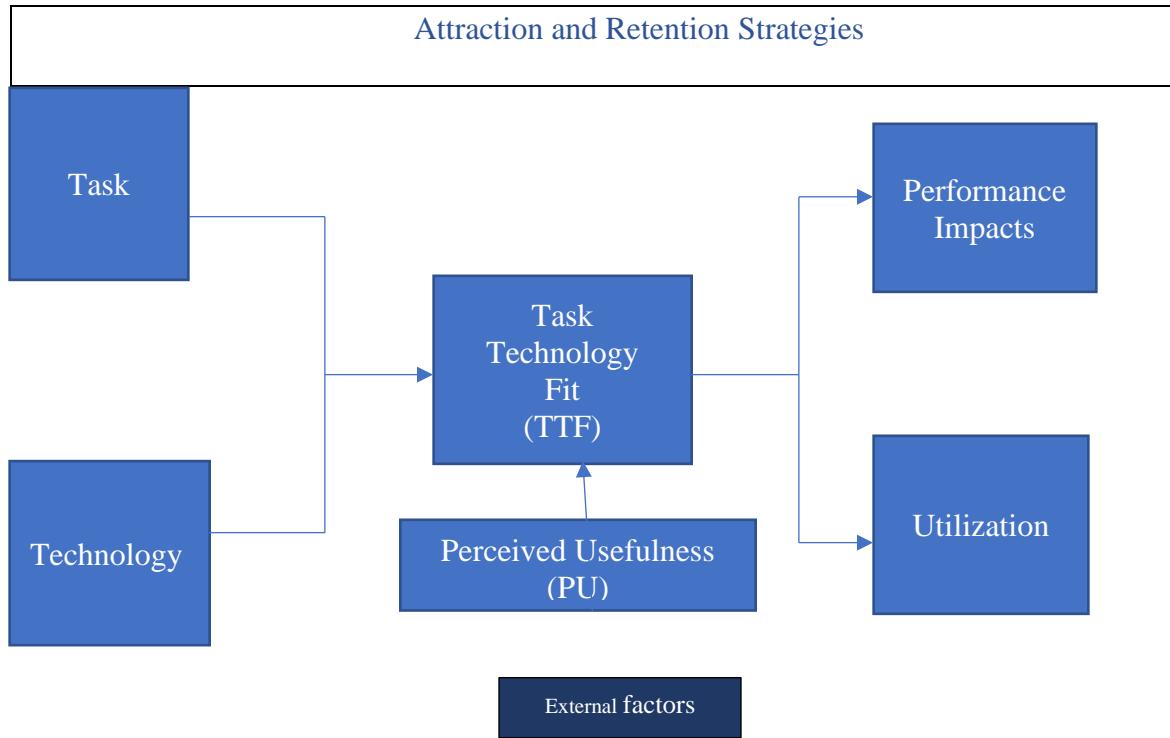
learning based on feedback, expectations to improve performance, and the amount of time spent operating an application, determine PU (Davis et al., 1989).

The Combined Framework

The key propositions of this study were that using the best-suited technology to accomplish a task and the PU of the technology will positively impact user performance and retention. TTF was applicable to this study because job satisfaction and job performance can positively impact employee retention and reduce the turnover for IT personnel (Rigotti et al., 2008). However, the purpose of the study was not to find a fit for employee job satisfaction. The purpose of the study was to determine the fit between the technology-focused approaches that IT managers use to attract and retain high-tech professionals. I combined TTF and PU to explore employee retention strategies that capitalize on the implementation of best-suited technology. Figure 1 represents the combination of TTF and the PU component of TAM.

Figure 1

The Conceptual Framework of Task-Technology Fit Theory and Perceived Usefulness as Applied to This Study



Note. The illustration shows how the task-technology fit theory (Goodhue & Thompson, 1995) and perceived usefulness, a component of the technology acceptance model (Davis et al., 1989; Saadé & Bahli, 2005), interrelate to explain the study phenomenon.

Definition of Terms

High-tech organizations: Organizations that employ STEM professionals (Wolf & Terrell, 2016).

High-tech professionals: Skilled, technically proficient individuals equipped with educational and career experiences in STEM (Wolf & Terrell, 2016).

Retention: The continued employment of competent individuals (Bansal, 2014).

Retention strategy: A planned process that is implemented to prioritize the needs and expectations of employees to retain talented individuals within the organization (Bansal, 2014).

Technology-focused strategy: The application of core technologies to assist an organization in achieving a competitive advantage (Kang, 2016).

Assumptions, Limitations, and Delimitations

Assumptions

Assumptions are unverified facts that are believed to be true (Johnson, 2012). When designing this study, I had several assumptions. One is that high-tech organizations exist in Atlanta, Georgia. I also assumed that IT managers use technology-focused strategies to attract and retain high-tech employees and that a sufficient number of these managers would be willing to truthfully share practical strategies that they have used to help their organizations attract and retain employees to achieve organizational goals. Another assumption was that the technology-focused approaches used by organizations to attract and retain employees will vary by organization.

Limitations

Limitations are potential weaknesses of the study (Johnson, 2012). Some limitations of this research were that the study involved only IT managers of high-tech organizations within the Atlanta metropolitan area. A different geographical location or sample (e.g., employees in varying roles) may have produced different results. The sample consisted of five IT managers in five high-tech organizations in Atlanta, Georgia. Including more managers and more high-tech organizations in the study may have

produced different results. Last, the study results were based upon the self-reporting of study participants. Some respondents may have been biased, which might have affected the validity of the findings.

Delimitations

Delimitations are the study's boundaries (Johnson, 2012) that limit the research scope (Simons, 2014). The focus of the research study was Atlanta, Georgia. I selected this geographical location because of its proximity to my place of business. Also, the study participants were IT managers in five high-tech organizations. Criteria for study participation in this study to answer the research question included employees with authority to decide technology usage and prior experience determining approaches to retain high-tech employees.

Significance of the Study

Contribution to Information Technology Practice

This research study may contribute to IT practice by providing IT managers with an understanding of practical strategies and best practices for using technology to attract and retain high-tech IT professionals. Attracting and retaining high-tech IT professionals are challenges for IT industry management (Saranya & Muthumani, 2015). Implementing effective attraction and retention strategies may enable leaders to retain high-tech employees who possess the required skills and fit into the organization and its culture (Martin & Ottemann, 2015). By applying effective attraction and retention strategies, IT managers may be able to decrease employee turnover.

Implications for Social Change

The findings of this study may promote social change by contributing to the economic growth of local communities. Keeping IT professionals employed, increasing resources available to the community, promoting investments in the local community, and strengthening local government budgets may result in positive social change. Continuous employment of the IT professional may help ensure sustainability by positively impacting the financial well-being of the IT professional through job and income security. Using the study's findings, business leaders may be able to implement strategies to ensure that IT professionals' salaries are commensurate with their skills and position. Increased skill utilization may increase employee job satisfaction and enhance employee productivity and the economy (Romero & del Mar Salinas-Jimenez, 2018). A skillset mismatch occurs when the skills acquired by the employee do not match the skills required for the position (Romero & del Mar Salinas-Jimenez, 2018). Although the reasons for a mismatch may vary, a skills mismatch is a likely source of job dissatisfaction (Romero & del Mar Salinas-Jimenez, 2018). Employees who experience job fit are less likely to quit their jobs (Lamm et al., 2015). There is a connection between the individual, job responsibilities, and job satisfaction (Lamm et al., 2015). Employee satisfaction leads to decreased employee turnover rates (Rose & Raja, 2016). Employee turnover impacts employee morale and productivity (Krishnan & Warier, 2014). For these reasons, society may benefit from a skilled, sustainable workforce to meet current demands for high-tech IT professionals.

A Review of the Professional and Academic Literature

In the literature review, I discuss research that relates to managerial strategies to attract and retain highly skilled IT professionals. I also explain the conceptual framework chosen for this study, which included (a) Goodhue's (1995) TTF and (b) Davis' (1989) PU component of TAM. I analyzed the presumptions related to and that supported this study. I discuss potential themes and phenomena for the study. Finally, I explain the relationship of this study to earlier research studies.

The review includes 115 peer-reviewed articles from journals, with 85% of the publication dates falling within the past 3 to 5 years. I used the Walden University Library and the Robert W. Woodruff Library, in the Atlanta University Center, to access databases. The databases included ProQuest, Emerald Management Journals, Business Source Complete, Directory of Open Access Journals, and EBSCOhost Primary Source Documents. I also used the search engine Google Scholar to find literature for the study. Seminal works included in the research support the conceptual framework of this study. The literature search strategy comprised keyword searches to find relevant references to validate the investigation. The keywords and phrases were *IT talent*, *IT retention*, *IT turnover*, *attract and retain IT*, *attracting and retaining talent*, *talent management*, *task-technology fit*, *e-recruitment tools*, *organizational attractiveness*, *technology adoption*, *recruitment*, and *gamification*.

In the review of the professional and academic literature, I highlight the following themes: (a) integration of technology in the recruitment process, (b) employee talent management, (c) the impact of technology on the economy, and (d) employee retention

strategies. I chose these themes for the literature review because I wanted to identify the procedures used to attract and retain IT professionals. I selected the TTF theory and PU component of TAM as the conceptual framework for the study because of their fit with the study. I sought to analyze employee retention strategies that capitalize on the implementation of best-suited technologies to impact user performance and retention positively.

Conceptual Framework

The purpose of this qualitative multiple case study was to explore technology-focused strategies that IT managers used to attract and retain IT professionals to meet the needs of a technology-driven workforce. The population for this study was IT managers of five high-tech organizations who implemented strategies to attract and retain highly skilled IT professionals. I conducted semistructured interviews, used member checking, and reviewed industry documents as part of the research process. The purpose of this literature review is to identify the conceptual framework and discuss key themes and recent research studies about attraction and retention strategies. The conceptual framework that informed this study consisted of Goodhue's (1995) TTF and Davis' (1989) PU component of TAM.

Task-Technology Fit Theory

Technology assists users in performing tasks, and task-technology fit is defined by how technology meets the needs of the required functions (Goodhue, 1995). When the provided technology enables job completion, user performance will have more positive results than when there is a disconnect between task requirements and technology

capabilities. Although technology can be a crucial determinant in accomplishing tasks, the utilization of the technology must occur before the impact of the technology can be measured.

TTF is the cooperation between the required tasks, skills of the users, and the capabilities of the technology. TTF is widely used to predict technology adoption and performance enhancement (Bere, 2018). According to Staples and Seddon (2004), the two methods for assessing task fitness are the facets-of-fit approach and the predicted-outcome approach. The facets-of-fit approach involves the researcher evaluating all required tasks and measuring whether the users can complete the tasks with the tools (Staples & Seddon, 2004). The predicted-outcome approach involves the researcher projecting whether utilizing the resources will produce the desired outcome for users (Staples & Seddon, 2004). By using the TTF to integrate these two approaches, the researcher can positively affect performance by examining the cooperation between the required tasks, users' skills, and the technology's capabilities.

Several factors impact a user's IT performance. Ease of use, perceived risk, and the ability levels of users are some of the characteristics that affect outcomes for task completion (Aljukhadar et al., 2014). Several factors impact a user's motivation to consent to use technology to perform an assignment. The belief that the use of technology will not require additional effort from the user, the user's perceived degree of uncertainty associated with technology use, and the user's prior knowledge, skills, and experiences influence a user's willingness to accept technology to complete a task (Aljukhadar et al., 2014). The connection between the characteristics of the task and user perception can

impact user performance. Bere (2018) confirmed that task and technology characteristics positively influence task-technology fit and performance.

In a recent study, Huang and Chuang (2016) examined the role of task-technology fit with e-recruitment, job search websites, and the impact on job seeker performance. The findings indicated that TTF positively impacted acceptance, use, and attitude toward job search websites because job seekers felt that they controlled whether to use the sites (Huang & Chuang, 2016). The findings indicated that the use of these sites positively influenced the performance impact of e-recruitment because the increased use of a job search website can lead to a decrease in unemployment durations (Huang & Chuang, 2016). A high task-technology fit will result in better performance (Bere, 2018).

Tam and Oliveira (2016) conducted a study to determine the impact on individual performance of utilizing mobile banking technology to complete banking transactions. The researchers applied TTF theory to the study and surmised that system usage improves performance when technology fits the assigned task (Tam & Oliveira, 2016). The researchers hypothesized that the better the match between the mobile-banking technology and the tasks, the higher the use of the mobile banking service (Tam & Oliveira, 2016). The study findings indicated that technology is used when it fits the assigned tasks and affects individual performance by saving time in conducting banking transactions. A high degree of TTF promotes the use of technology. The study applied to my research because the results contribute to the body of knowledge about strategies to impact employee performance, positively promoting employee retention. This

information may inform IT managers about other approaches to utilizing technology to attract and develop employees.

According to Chung et al. (2015), enterprise mobile technologies foster internal and external organizational collaboration, provide access to real-time information, and promote creativity. Using TTF, the researchers examined the impact of enterprise mobile applications (EMA) on creative job performance (Chung et al., 2015). The researchers investigated how use of EMA and TTF for EMA are associated with employees' perceived performance improvement and productivity increase. The researchers hypothesized that: (a) TTF, concerning the use of EMA, positively influences job performance, (b) TTF affects the habitual use of EMA, and (c) the routine use of EMA positively impacts an employee's perceived job performance. The research findings indicated that an employee's perceived TTF of EMA is positively associated with the frequent use of EMA and job performance. The results of this study are applicable in assisting managers in determining the impact of technology usage on job performance and creativity. The study indicated that the fit between the assigned task and the EMA positively impacted the employee's job performance. Chung et al.'s (2015) study was relevant to my research because I explored strategies that managers used to attract and retain high-tech professionals. Utilizing suitable technology in the workplace positively impacts employee performance. When a user applies a technology that matches a task, the user perceives the usefulness of the technology (Howard & Rose, 2019). The realization of the benefits of technology utilization for task completion may result in continued technology usage (Howard & Rose, 2019).

Additionally, Gerhart et al. (2015) conducted a study to determine how students perceive that their task of learning fits with the use of e-book technology and how the technology fit impacts the usage of the technology. The researchers created a model called e-textbook TTF that is an extension of TTF and encompasses the consumer acceptance and use of technology (UTAUT2) theory, which is an extension of TAM (Gerhart et al., 2015). The researchers hypothesized that e-books would positively impact users' motivation to use e-book technology and improve perceived TTF. The study results indicated that when students perceive a fit between the learning task and e-book technology, they are more likely to use e-book technology. Furthermore, there is a strong relationship between perceived TTF and performance. Gerhart et al.'s study related to my research because I explored strategies to attract and retain high-tech professionals. Using technology that fits the assigned task and that employees perceive as helpful for improving their performance will likely be used. Therefore, successful employee performance positively impacts employee retention.

Khan et al. (2018) conducted a study to understand the factors that influence students' adoption of massive open online courses (MOOCs) in Pakistan by incorporating TTF in the study. The researchers applied TTF to connect the fit of technology use for online learning and the task of learning. Khan et al. hypothesized that the technological and task characteristics of MOOCs influence TTF. Furthermore, the technology fit influences the students' intention to adopt MOOCs (Khan et al., 2018). The study findings indicated that matching the technology of MOOCs with the task of learning is appropriate. According to Khan et al., the fit between the task and technology

characteristics positively impacts the students' behavioral intention to adopt MOOCs in an online learning environment. The study by Khan et al. is related to my research because I explored strategies to attract and retain high-tech professionals. One approach examined in Khan et al.'s study is online learning for training and career development purposes. With more skills and technology that fits required job tasks, employees will perceive the utility of the technology and experience the impact of technology usage on job performance. According to Tam and Oliveira (2016), TTF extends the TAM by considering how the task affects technology use.

Technology Acceptance Model

TAM is a model that is used to study users' acceptance of technology. In TAM, system usage depends upon user motivation, which helps to determine whether the user will accept or reject the system (Davis, 1989). Factors used to explain system use include perceived usefulness (PU), perceived ease of use (PEOU), and user attitude toward use (ATT; Davis, 1989). Using TAM, Kim and Ausar (2018) sought to determine the relationship between employees' technology usage, engagement, and their impact on organizational outcomes. Kim and Ausar found that the increased use of the company's virtual employment engagement platform improved employee engagement and increased employee retention. They concluded that increased use of workplace technology, when perceived by employees as applicable, will improve employee job performance because users can allocate time for other activities. Park et al. (2014) contributed to the knowledge of TAM by showing that institutional and social norms govern the utilization of group-based technologies in the workplace. TAM applies to this study because of its

extensive use to evaluate information systems acceptance (Bach et al., 2016). By assessing employee attitudes towards selected technologies, business leaders may improve employee performance and retention (Bach et al., 2016). A user's intent to utilize technology increases with the realization of the benefits of using technology. PU, a component of TAM, was chosen for this research because the focus of the study was on technology-focused strategies for attracting and retaining high-tech professionals.

When determining the impact of technology on user performance, the utilization of technology was a consideration. PU originated from Bandura's (1977) self-efficacy theory, which defines self-efficacy as one's belief in their ability to achieve goals. PU is a component of the TAM (Saadé & Bahli, 2005). PU is the extent to which a user believes that using a specific application will increase job performance (Saadé & Bahli, 2005). According to Davis (1989), a system is high in PU when a user believes that a relationship exists between technology usage and job function. According to TAM, PU predicts the behavioral intention to use technology (Park et al., 2014). A user's intent to use technology increases with the realization of the benefits of the technology.

Adapted to fit this study, PU is the extent to which IT managers believe that technology-focused strategies would positively affect user performance and retention. According to Davis et al. (1989), perceived usefulness may influence the use of technology. PU relates to technology-focused strategies to attract and retain high-tech professionals because high-tech software attracts high-potential job candidates. Applicants and organizations use a variety of technological advancements to form connections between employers and employees. In a recent study, To et al. (2018)

researched the factors driving high-tech building professionals to use software for smart and sustainable building technologies. According to To et al. (2018), users evaluated new technologies based on PEOU and PU. The study's findings showed that building professionals positively perceived new technologies because of the advantages associated with adopting new technologies. This study applied to the research study because using smart building technologies enhanced the performance of building professionals during building design and construction (To et al., 2018).

A relationship exists between a person's beliefs and that individual's actions. According to Saadé and Bahli (2005), PU is the extent to which a user believes that using a specific application will increase job performance. Employees' beliefs in the match between the technology and the ability to achieve organizational goals can affect how organizations conduct business, maximizing performance (Tam & Oliveira, 2016). A gap between technology capabilities and employees' task performance will challenge IT managers. It may result in employee turnover within organizations.

Employee turnover is a challenge that organizations face. Choudhary (2016) noted that an organization's success depends on the retention of essential employees and that the loss of top talent affects organizational costs and performance. Employees who have the knowledge and skillsets needed to attain organizational goals are vital resources, and they positively impact corporate finances (Elnaga & Imran, 2013). Employee turnover can negatively affect organizational performance, and managers need to understand why employees leave. Chakrabarti and Guha (2016) conducted a study to determine the factors that affect employee turnover. Six factors that cause voluntary

employee turnover were central in the investigation. The researchers noted that organizations could affect employee turnover by developing strategies to include the organization's goals and the employee's goals. The researchers stated that the six factors in the study: (a) higher salary, (b) more top portfolio, (c) higher company brand name, (d) others (e) employee's age, (f) employee's attitude towards life and work, was not exhaustive. Increased employee turnover rates are a challenge for some organizations because of the impact on organizational performance.

The measurement of turnover rates occurs by comparing the total number of employees who left an organization during the year with the total number of employees hired at the beginning of the year. Idell et al. (2021) noted that between 2014 and 2017, the IT employee turnover rate increased: 9% in 2014, 8.6% in 2015, 8% in 2016, 7.3% in 2017, and 8.2% in 2018, and 69.9% of the turnovers were voluntary. Similarly, in India, the IT industry experiences 10 to 15% employee resignations yearly (Saranya & Muthumani, 2015). The rising employee turnover rates result in surging organizational costs due to the expenses associated with replacing and training newly hired employees. Turnover rates are indicators of the health of an organization, and IT managers need strategies to reduce the turnover rates for highly skilled IT personnel.

The tenets of my study are that using the best-suited technology to carry out a task and the perceived usefulness of the technology may positively impact user performance and retention. In this study, IT managers used strategies, including technology, to attract high-tech employees. The purpose of the study was to determine the linkage between technology-focused methods and attracting and retaining high-tech professionals. I used

the TTF theory and PU to analyze employee retention strategies that capitalize on the implementation of best-suited technology. Usually, the TTF theory would have been applied to this study because job satisfaction and job performance can positively change employee retention and reduce the turnover of IT personnel. However, the purpose of the study was not to find a fit for employee job satisfaction but to find a connection between attraction and retention strategies for high-tech personnel and technology-focused strategies.

Analysis of Supporting Theories

TTF and PU, a component of TAM, provided the conceptual framework for the study. Alternative theories, such as Herzberg's two-factor theory (Herzberg et al., 2017), the theory of work adjustment, and the zone of proximal development theory, supported the study's conceptual framework.

Herzberg's Two-Factor Theory. Herzberg's two-factor theory (Herzberg et al., 2017), influenced by Maslow's (1943) hierarchy of needs, was a conceptual framework considered for this study. The separation of job factors into categories can lead to satisfaction and dissatisfaction (Herzberg et al., 2017). These factors, known as hygiene and motivators, affect the quality of work. Because the researcher aimed to explore technology-focused strategies used to attract and retain highly skilled IT professionals in a high-tech workforce, the focus was not on hygiene factors such as pay and benefits. Motivators are related to growth and self-actualization. Thus, I focused on motivators from Herzberg's theory for this study. Achievement of self-actualization occurs when maximized potential occurs, focusing on personal growth and not satisfying basic needs

(Maslow, 1954; Sze, 2015). Increasing motivators, such as recognition, growth, responsibility, and advancement, lead to job satisfaction. Kowal and Roztocki (2015) conducted a study to determine the impact of business competence on the job satisfaction of 391 IT professionals. Kowal and Roztocki (2015) found that business competence affects the job satisfaction of IT professionals and may improve productivity. The two-factor theory applied to this study because IT managers can positively change employee retention by increasing employee motivational factors. This positive change may reduce the turnover for IT personnel, which results in financial savings and improved employee retention for the organization. I did not choose the two-factor theory for this study because factors that lead to job satisfaction and dissatisfaction were not the primary focus of the research. Although the findings indicated elements that resulted in increased employee motivation and reduced employee turnover, the study's main objective was to examine technology-focused strategies for attracting and retaining high-tech professionals. The two-factor theory did not support the primary focus of this research.

Theory of Work Adjustment. The theory of work adjustment (TWA), by Dawis and Lofquist (1984), was a conceptual framework considered for this study. The theory defines work as the interaction between an employee and the work environment. The tenet of the research was that work environments require specific skills for employees to accomplish tasks, and the employees must meet the needs of the employment setting and vice-versa. Work adjustment occurs when there is mutual agreement of the work environment with the employees' performance and the satisfaction of employees with the work environment; work adjustment results in tenure and may improve employee

retention. Tarim (2016) noted that positively impacting employee and company performance could be accomplished by: (a) assigning tasks based upon the skill set of the employee, (b) ensuring that the career goals of the employee align with the competency needs of the organization, (c) ensuring that employees have opportunities to demonstrate talent to promote individual and organization growth, and (d) helping the employee to experience career advancement. The TWA applied to this study because job satisfaction can positively affect employee retention and reduce the turnover of IT personnel.

Technology integration may impact employee satisfaction and retention. The TWA was not chosen for this study because facets of job satisfaction and employee retention were not the primary focus of the research. Although increased employee retention, reduced employee turnover, and employee satisfaction may have been outcomes of the study, the study's primary goal was to examine technology-focused strategies for attracting and retaining high-tech professionals. TWA was not the chosen framework for the study because it did not support the primary focus of this research.

Zone of Proximal Development Theory. Lev Vygotsky's (1978) zone of proximal development (ZPD) theory was considered for this study. ZPD defines the differences between tasks that a learner can perform without assistance, tasks that a learner can perform with help, and duties that a learner cannot accomplish when provided with support. When a learner interacts in a learning, cooperative environment, and a gap exists between the user's performance and assisted performance, a ZPD occurs (Clapper, 2015). Through collaboration, a shift can occur between what a learner can perform with help and what a learner can perform individually (Eun, 2019). The tenet of the study was

that a learner's development potential increases by receiving guidance from external sources. ZPD theory applied to this study because IT managers can positively impact employee retention by increasing employee development by employing gaming principles and integrating technology-enabled tools to attract and retain employees. ZPD theory was not chosen for this study because the focus of the research did not include a comparison of the differences between tasks that a learner can perform without assistance, tasks that a learner can perform with help, and duties that a learner is unable to perform at all when provided with support. The focus of this study was to examine technology-focused strategies for attracting and retaining high-tech professionals. Because the aim of the ZPD theory is not technology-focused strategies for attracting and retaining high-tech professionals, ZPD theory was not an appropriate conceptual framework for this study.

Analysis of Contrasting Theories

The development of the conceptual framework for this study included an examination of TTF and PU, a component of TAM. Theories that did not support this study included the job characteristics model and social exchange theory.

Job Characteristics Model. Job characteristics theory (JCT) originated from Hackman and Lawler (1971) and was later modified to the job characteristics model (JCM) by Hackman and Oldham (1976). According to Hackman and Lawler (1971), before the 1960s, jobs were designed to be simplified to increase production, which resulted in unmotivated and dissatisfied workers. JCM, a simplified, updated version of JCT, was not considered for this study. The foundation for the theory is that the

characteristics of the assigned tasks motivate employees. Thought-provoking duties motivate employees more than repetitive, unstimulating tasks. By connecting the core job dimensions of (a) skill variety, (b) task identity, (c) task significance, (d) autonomy, and (e) feedback with the three psychological states of (1) experience meaningfulness of work, (2) experienced responsibility for work outcomes, and (3) knowledge of the results of work activities, Hackman and Oldham (1976) defined JCM. With the establishment of core job dimensions and the achievement of psychological states, employees will experience (1) high internal motivation, (2) high-quality work performance, (3) high job satisfaction, and (4) high work effectiveness (Hackman & Oldham, 1976). The tenet of JCM is that the knowledge of performing well on assigned tasks positively impacts employees. Steyn and Vawda (2014) conducted a recent study investigating the influence of job characteristics on job satisfaction, stress, and depression. The study findings indicated a relationship between job characteristics and outcomes, and job design is not a predictor of the impact on employees' mental health (Steyn & Vawda, 2014). JCM was not meaningful for this study because job satisfaction and performance were not the primary focus of the research. The purpose of the study was to explore technology-focused strategies for attracting and retaining high-tech professionals.

Social Exchange Theory. According to Cropanzano and Mitchell (2005), Social Exchange Theory (SET) is an influential conceptual paradigm for understanding behavior in the workplace. George Homans (1958) developed SET and defined social behavior as the exchange of material and non-material goods, such as symbols of approval or prestige. According to Homans (1958), the transfer of items should result in equilibrium.

The tenets of SET are that individuals will make decisions based upon expected beneficial outcomes. When the favorable outcomes are minimal, the exchange of goods will end. According to Harden et al. (2018), an example of social exchange theory in the workplace is an employee exchanging knowledge, skills, and abilities for organizational economic outcomes such as financial rewards, promotions, and benefits. SET was not an appropriate conceptual framework for this study because the study did not focus on pay and benefits but explored technology-focused strategies to attract and retain highly skilled IT professionals in a high-tech workforce.

Analysis of Potential Themes and Phenomena

During the development of this study and review of the literature, I identified themes related to strategies that IT managers may employ to positively impact employee retention and reduce turnover. The pertinent themes explored include: (a) the impact of technology on the economy, (b) employee retention strategies, (c) employee retention and talent management, (d) high-tech tools to attract high-potential job candidates, and (e) alternative methods to attract high-potential job candidates.

The Impact of Technology on the Economy

Technology is a driving force for business and the global economy. Hessler (2014) stated that technology is the first driver of economic growth, and it has transformed the lives of corporations. The Association of Southeast Asian Nations (ASEAN) improved their economies and total production by more than 15% from 2008- to 2015 by increasing the import and export of information communication technology (ICT) products by 10% (Neamhom et al., 2018). High-tech industries provide

approximately 10% of all U.S. jobs (Roberts & Wolf, 2018). High-tech industries offer higher salaries for all occupations, accounting for 14.5 million jobs and 9.9% of total wages and salaries (Roberts & Wolf, 2018). Careers that include many STEM workers (science, technology, engineering, and mathematics) comprise the high-tech industry IT workers, scientists, and engineers (Wolf & Terrell, 2016). The rise in technology usage increased productivity and economic output for the Southeast Asian Nations.

Technological developments boost the U.S. economy by increasing both high-tech jobs and salaries. Because technology is a driving force for business and the global economy, skilled workers are needed to meet the demands of a high-tech workforce.

Risks of Technological Unemployment. Technology has transformed the labor force and the skills required of workers. Because society heavily relies on technological advancements, the workforce has become dependent upon and vulnerable to automation technology (Coeckelbergh, 2015). Hicks (2018) estimated that 45% of work-related activities could be automated using current technological developments. Automation may result in the loss of 7% of today's jobs by 2025 (Hicks, 2018). Decker et al. (2017) conducted a study to explore the impact of the substitution of robotic labor for human labor on the workforce. Technological advancements have aided in integrating automation into the labor force, which has resulted in increased efficiency and savings in labor costs (Decker et al., 2017). Decker et al. (2017) concluded that increased machine language intelligence had catalyzed the transition of robots from human labor substitutes to the workforce's complements. Furthermore, the impact of robotics on the labor force

will vary from technological unemployment and increased efficiency to human and robot collaboration in the workforce.

DeCanio (2016) conducted a study to determine conditions needed for artificial intelligence to decrease wages and explore the interchange between the substitution of human and robotic labor. The research findings indicated that it is inconclusive that the increased usage of robots causes a decline in jobs (DeCanio, 2016). However, some robots can perform tasks that require low-level skills (DeCanio, 2016). The increased usage of robots will cause a decline in occupations that require low-level skills but will cause an increase in jobs not impacted by computerization. The study's findings indicated that as robotic labor increases, human wage decreases (DeCanio, 2016). Replacing repetitive jobs with computers will impact wages and could lead to technological unemployment (DeCanio, 2016).

Similarly, Frey and Osborne (2017) conducted a study to determine the susceptibility of jobs to computerization. Previous studies indicated that computerization included only manual tasks (Frey & Osborne, 2017). Frey and Osborne (2017) noted that computerization could extend to include non-routine tasks. The study results showed that increased machine language usage would cause a decrease in the demand for routine jobs and an increased demand for jobs that are not subject to computerization (Frey & Osborne, 2017). The study's findings indicated that 47% of the workforce is at risk of decreased employment, and there is a relationship between an individual's education, wages, and computerization (Frey & Osborne, 2017). The shift in skills needed in the

high-tech workforce is causing an increased need for IT professionals to develop higher-level skills.

The accelerated rate of technological advancements has caused an evolution in the skills needed by IT professionals (Kappelman et al., 2016). Organizations must upskill employees (Peng et al., 2018). Routine tasks can now be replicated by automation, robotics, or artificial intelligence, resulting in obsolete low-tech jobs. These technologies will also create new jobs that require new skills and training (Wilson et al., 2017). IT professionals must develop skills that cannot be simulated through computerization to remain relevant in a dynamic, high-tech workforce.

Employee Retention Strategies

Employees are the key to organizational success. Balakrishnan (2014) defined retention strategies as the policies and procedures instituted by an organization to influence key personnel to remain with the current employer. According to Naqvi and Bashir (2015), an employee's emotional attachment, self-identification within an organization, and organizational involvement impact an IT professional's organizational commitment. Naqvi and Bashir (2015) indicated that providing competitive compensation, training, and development in the latest technologies and involvement in decision-making are some factors that contribute to organizational commitment. Increased organizational commitment is a strategy to impact retention positively (Naqvi & Bashir, 2015). Successful organizations can retain their key personnel.

Because employee retention is a primary organizational goal, IT managers must select strategies to motivate skilled professionals to remain with the organization.

Balakrishnan (2014) indicated that to retain key personnel, IT managers must provide incentives, salary, motivation, and a supportive environment. Strategies used to improve employee retention include considering employees' career goals and daily work expectations, providing training programs and employee recognition, and encouraging employee involvement in organizational decision-making (Luscombe et al., 2013). A strategy to improve retention is to provide hybrid career development paths for IT professionals, which provides professionals with the freedom to choose a career path (Biron & Eshed, 2017). Hybrid career development paths help IT professionals achieve career fit and decrease employee turnover (Biron & Eshed, 2017). Joia and Mangia (2017) stated that the absence of professional development and career advancement opportunities causes IT professionals to transition to careers in other fields and contributes to rapid turnover rates. To decrease employee turnover and increase retention, organizations must provide a clearly defined path for development.

Letchmiah and Thomas (2017) conducted a study to identify factors that positively impact the retention of high-potential employees in a development finance company. The study findings indicated that factors that influence the retention of high-potential employees include leadership and organizational culture, organizational purpose, developmental opportunities, meaningful work, and collegiality. The findings of this study may assist managers in developing strategies to increase the commitment levels of high-potential employees and improve the retention of high-potential employees. To decrease employee turnover and increase retention, organizations must identify factors positively impacting employee retention.

Retention Challenges for Firms. Recruiting and retaining highly skilled professionals is a challenge for high-tech firms. Stone (2017) stated that 86% of employers have difficulty hiring IT professionals. More than 50% of employees actively seek other employment opportunities, negatively impacting organizational productivity (Cloutier et al., 2015). IT firms' employee turnover is an issue (Korsakiene et al., 2015). The turnover rate has increased globally among IT professionals, and the shortage of skilled professionals has driven high employee turnover rates (Korsakiene et al., 2015). Organizational stability is related to low employee turnover rates, and instability correlates with high employee turnover rates (Mitrovska & Eftimov, 2016). Tlaiss et al. (2017) stated that the negative organizational impact of employee turnover includes the knowledge void left by the departing employee and the recruitment and training costs for the replacement personnel. Additionally, the employee turnover cost per employee is the cost of the employee's annual salary (Mitrovska & Eftimov, 2016). To combat a decrease in organizational productivity and ensure organizational stability, the retention of top talent is essential for the survival of an organization.

Employee Retention and Talent Management

Retention of employees who possess the knowledge and skills needed to attain organizational goals is vital for business sustainability. According to Zylka and Fischbach (2017), the retention of skilled IT professionals is crucial for the success of organizations. When organizations fail to retain high-performing employees, the results for the organization are loss of knowledge and increased organizational costs (Zylka & Fischbach, 2017). Narayanan (2016) stated that talent management is a popular retention

strategy for reducing employee turnover of talented, high-potential, or high-performing employees. Although there is no universal definition of talent management, Gallardo-Gallardo and Thunnissen (2016) defined talent management practices as attraction, recruitment and selection, training and development, retention, and talent identification. The implementation of talent management techniques positively impacts employee retention of talented employees.

Narayanan (2016) conducted a study to develop proposals about the connection between talent management practices and employee retention and the influence of perceived job embeddedness. The researchers linked talent management practices, job embeddedness, and the employee's intention to stay. Research findings indicated that talent management directly influences turnover intentions and increases retention rates. In a similar study, Johennesse and Chou (2017) conducted a study to understand how talent management processes contribute toward effective performance management and impact employee retention in Taiwanese companies. The actions performed were based on employee experiences and perceptions of talent management processes on their retention. Employee training and development, employee appraisal and feedback, employee empowerment, remuneration, and business coaching were factors used for the methods of the study. The research results by Johennesse and Chou (2017) provide IT managers with strategies to target essential factors that impact employee retention through increased awareness and knowledge of how employees are motivated and retained. Talent management can assist managers in retaining critical employees.

High-performing employees, who can improve business performance, are the primary focus of talent management (King, 2015). The U.S. Office of Personnel Management (2019) stated that talent management exists to ensure that the right people with the right skills occupy the right position at the right time to ensure that the organization achieves its mission. According to Swailes et al. (2014), talent management refers to the 1-10% of high-performing, high-potential employees in an organization. High-performing, high-potential employees are essential for organizational success, and talent management activities reduce turnover rates for highly skilled personnel. Using a qualitative case study approach, Kim et al. (2014) conducted research with best-practice organizations, resulting in a comprehensive, theoretical model for developing technical talent management programs. The retention of highly skilled employees will positively impact business outcomes.

Employee Engagement and Turnover. Maintaining an engaged workforce can positively impact employee retention and performance. Engaged employees are committed to the goals and values of the organization and motivate co-workers to achieve organizational goals (Anitha, 2014). According to Ertürk and Vurgun (2015), employees who feel motivated and supported are more likely to remain with an organization. Strategies that IT managers can use to demonstrate support for IT professionals include: (a) demonstrating integrity and trustworthiness, (b) sharing information through open communications, (c) creating a collaborative environment, (d) meeting regularly with employees to provide performance feedback, (e) empowering employees to be involved in decision-making, (f) providing career development and training, and (g) providing

employee recognition for contributions to the workplace (Ertürk & Vurgun, 2015). Eom (2015) stated that the IT personnel who feel valued and recognized for their corporate contributions are likely to remain with an organization. Kennedy and Daim (2010) indicated that employee engagement and retention are vital for success. Lowman (2016) conducted a study to explore strategies for attracting and retaining workplace talent, and the findings of the research indicated that employee engagement decreases turnover and improves retention rates.

The central claim of the study conducted by Memon et al. (2014) was that the relationship between organizational culture, employee values, and the person-organization fit impacts employee retention. Memon et al. (2014) indicated that person-organization fitness leads to employee engagement and reduces turnover. Factors that facilitate employee engagement include work environment, leadership, interpersonal work relationships, training, career development, compensation, organizational policies, and workplace well-being (Anitha, 2014). To positively impact employee retention, IT managers are responsible for empowering employees, providing competitive salaries, and developing and maintaining employees' skills (Ahmed et al., 2017). Moen et al. (2016) conducted a study to determine the impact of employee control and supervisory support on the well-being of IT professionals. The research findings of Moen et al. (2016) indicated that the work environment, work hours, and supervisory support are some factors that impact workplace well-being and employee retention. Organizations with actively engaged employees reap the benefits of loyal employees, better well-being of employees and families, and increased business performance (Romans & Tobaben,

2016). The active engagement of employees results in decreased employee turnover (Romans & Tobaben, 2016). Moore et al. (2016) conducted a study to investigate the significant role of managers in setting the work environment and retaining employees. The study's findings indicated that managerial openness impacts turnover intention (Moore et al., 2016). Candidness includes concern for employees, listening to employees, acting on behalf of employees, and providing a risk-free zone for honest communications (Moore et al., 2016). Employee engagement impacts turnover intention and is a critical factor in employee retention.

Threats to Employee Well-Being. Job insecurity replaced employment stability due to rapid technological advancements. Job insecurity, which causes employee performance to decrease, is defined as the uncertainty of employment continuity and stability (Shoss, 2017). Employee job security is beneficial to the success of an organization and the well-being of its employees. Well-being includes an individual's mental, physical, and general health and satisfactory work-related and non-work-related experiences (Nielsen et al., 2017). Unreasonable workloads and work-related pressures destabilize the well-being of employees (Boxall & Macky, 2014). Enhanced environments that cultivate open communication, individual training and development, and self-governance stabilize employee well-being (Boxall & Macky, 2014). Guest (2017) stated that some technological advancements, such as automation, telecommuting, and an increase in information accessibility, can positively and negatively impact the well-being of employees. Technology innovations can positively impact employee well-being by increasing task specialization and decreasing workload. Technology innovations

can negatively impact the well-being of low-skilled individuals by causing routine tasks to become outdated, which may lead to job insecurity. Job insecurity adversely affects the well-being of employees and can influence job performance (Yang et al., 2019).

Reducing job insecurity will improve organizational performance and enrich employees' workplace experience.

Employee Training and Development. Training and development of high-potential employees are imperative for organizational success. Biron and Eshed (2017) conducted a study with engineers, computer scientists, and other IT professionals. The study results indicated that it is an expectation for organizations to provide employees with opportunities for professional growth and development (Biron & Eshed, 2017). Downs (2015) indicated that 96% of executives surveyed believe that high-potential employees positively impact organizational recruitment and retention and that investment in the development of high-potential employees is essential. Mathimaran and Kumar (2017) concluded that training and development are critical factors impacting employee retention. Hirsch (2015) researched retention strategies used by a business leader in analytic business software. Hirsch (2015) determined that SAS provides professional development for employees during all stages of their professional career and helps to develop a growth mindset in employees. SAS provides networking opportunities between executives and those employees who have not reached an executive status, and IT personnel are continuously encouraged to develop their intelligence and skills (Hirsch, 2015). Stone et al. (2015) suggested that organizations integrate technology in training

design to affect learning outcomes. Successful organizations ensure longevity by providing continuous training and development for employees.

High-Tech Software to Attract High-Potential Job Candidates

The use of technology in the recruitment process has changed the hiring strategies used by organizations and the search techniques used by job applicants to locate job openings. Companies and candidates rely on technology to improve recruitment in a competitive market for top talent. Sahay (2015) conducted a study to explore emerging trends and challenges in recruiting job seekers. A shift from an employer-driven market to a candidate-driven market has occurred. Developing tools, such as social media, video, big data, cloud-based platforms, and mobile computing platforms, are some technologies used to match job seekers with career opportunities. Organizations must now embrace various new technologies to market the company's brand to attract employees and gain a competitive advantage.

Social networks are a viable source for skilled candidates, and organizations use social networks to create a social presence and attract candidates (Jones, 2016). According to Blacksmith and Poepelman (2014), 83% of organizations have transformed recruitment by using social media to recruit applicants using their social media profiles. Applicants may use social profiles instead of resumes to apply for jobs using LinkedIn and applicant tracking systems (Jones, 2016). The LinkedIn profile is a dynamic, digital resume compared to the static, traditional resume (Zide et al., 2014). Applicants use new technologies, such as webinars, videos, and blogs, to gain insider information about organizations of interest (Blacksmith & Poepelman, 2014).

Organizations use tools to form connections and build relationships with applicants while increasing awareness about the company brand. According to Adler and Ghiselli (2015), employer branding helps to reduce employee turnover, reduces recruitment costs, and helps to increase employee retention. Job seekers use various technologies to learn more about potential employers and build their online presence. Technology has transformed the job-seeking process for applicants and organizations' recruitment and hiring strategies.

e-Recruitment. E-recruitment is defined as using online resources to attract and hire new employment candidates for an organization. According to Radhika and John (2016), e-recruitment helps support conventional recruitment methods. Traditional recruitment methods include internal hiring, print advertisements, paper-based applications, employment agencies, employee referrals, and temp agencies. Although conventional recruitment methods may have proven effective in the past, these recruiting techniques have been costly and time-consuming. Traditional recruitment methods neither include minimal organizational costs nor unlimited access to potential job applicants' global pool (Koch et al., 2018). Limiting the number of applicants for potential career opportunities can lead to the recruitment of the wrong candidate and create expenses for the organization (Koch et al., 2018). The coupling of e-recruitment and traditional recruitment methods can increase the probability of selecting the correct candidates for career opportunities, expedite the recruitment process, and help expand the global capacity of connecting job seekers and organizations. E-recruitment is similar to an umbrella encompassing digital practices, tools, and platforms for attracting skilled

candidates (Holm, 2014). Interactive e-recruitment and interactive technologies should help organizations attract applicants and positively impact the motivation levels of potential hires to apply for jobs (Stone et al., 2015). The utility of this study was to examine tools, such as social media, search engines, gamification, and artificial intelligence used for recruitment purposes.

Use of Social Media. Various technologies, including social media, have been adopted in the recruitment process. From 2011 to 2016, a significant shift toward adopting social media platforms occurred because companies recognized the value of social media technology in their organization (Deans & Tretola, 2018). Social media is a low-cost tool for finding employees and personal and company branding (McCabe, 2017). Social media helps customize online presence to a specific audience and build associations among users (Qi et al., 2018). Social media allows for instant communications with a global audience (Qi et al., 2018), and social media provides a means for organizations to attract a more significant number of applicants. The use of social media as a recruiting tool has increased in popularity (Dutta, 2014).

Kashi et al. (2016) conducted a qualitative study to identify critical factors driving Australia's organizational adoption of social recruiting technologies. The researchers performed comparisons in benefits versus complexity compatibility. The selection of organizations for the study depended on whether they had adopted or intended to adopt social recruiting technologies as a part of their recruitment strategies. The researchers grouped the organizations into adopters, laggards, and non-adopters. The researchers investigated the key factors that influence organizations to adopt social recruiting. The

researchers applied the Tornatzky and Fleisher Technology, Organization, and Environment (TOE) framework. The research findings indicated that the perception of benefits, support of top management, and managers with recruitment knowledge and social recruitment skills are the most critical drivers of technology adoption. The research findings also indicated negative legal, ethical, and privacy issues in adopting social recruiting technologies. The study conducted by Kashi et al. (2016) applied to my research study because the impact of social media recruiting positively enhanced strategies used by some organizations to attract and retain employees. Social media can be a valuable tool for companies to implement to satisfy the labor force needs of the organization.

Job applicants and organizations seeking to attract new talent actively adopt social media. Social Networking Sites (SNS) users who post information about new technologies and industry standards attract the attention of IT recruiters (Capiluppi et al., 2013). Some IT recruiters use SNS as sources to determine the personal fit within an organization. The recruiters may search profiles to learn how others have acknowledged the professional activities of candidates. The use of SNS benefits candidates by increasing their social presence and social skills and by providing employers with the convenience of direct access to references.

The rapid growth of SNS has implications for using this platform as a multipurpose organizational resource. Previous research studies referenced TAM and TTF regarding factors that motivated the acceptance and use of technology and the impact on user performance (Lu & Yang, 2014). However, neither TAM nor TTF

includes the social factors that impact user performance (Lu & Yang, 2014). SNS allows individuals to interact and build relationships and may address social needs. The features provided by SNS can help satisfy users' social needs (Lu & Yang, 2014). SNS may increase the intention to use technology (Lu & Yang, 2014). SNS adoption can be used in business to boost employee engagement by addressing social needs and creating an environment to improve learning and user performance.

The introduction of SNS to the recruitment model has caused a shift in the traditional hiring and decision-making process from the employer to the employment candidate. SNS, in recruitment, has prompted the need for employers to find cost-effective ways to attract new hires. The need for cost-effective acquirement processes is evident in the 7% cost increase of hiring a new employee and the increase in time needed to fill a vacant position (Phillips-Wren et al., 2016). SNS may be applicable as a relationship-building strategy to attract and attain new talent and as a tool for prospective job seekers to gain information about companies, determine the fit within an organization, and compare the employment opportunities between competitors. SNS has caused an evolution in strategies used for attracting and retaining professionals. The most popular SNS used by applicants and employees is LinkedIn (Zide et al., 2014).

LinkedIn. Launched in 2003, LinkedIn is a social platform used to aid in the recruitment process (Wilson, 2009). Social networking companies, like LinkedIn, have revolutionized the recruitment practice by providing access to qualified job applicants in a single location (McCabe, 2017). LinkedIn is the most widely used professional social media website and has over 332 million members in 200 countries (Bohmova, 2016).

Recruiters use LinkedIn to search for potential candidates and verify details provided by candidates (Koch et al., 2018). According to Zide et al. (2014), information on LinkedIn may be more accurate than the information included on a traditional resume because the online information may be immediately verified. LinkedIn is categorized as a professional social networking site because recruiters target professionals (Capiluppi et al., 2013). Candidates may use LinkedIn to track career paths and publish skills and achievements (Capiluppi et al., 2013). Candidates who use LinkedIn are responsible for marketing their skills and accomplishments by fully populating the profile (Zide et al., 2014). According to McCabe (2017), LinkedIn users with a completed profile are 40 times more likely to find organizations searching the database for applicants. LinkedIn is a valuable tool for employers and applicants alike.

Gamification. Gamification uses gaming principles, such as points, badges, and competition, to accomplish specific goals in a non-gaming context. Gamification aims to align learning and engagement technology with the social media approach (Larkin, 2017). Gamification may be used to allow for increased interpersonal intervention levels and improve the effectiveness of e-learning and e-training (Stone et al., 2015). According to Dale (2014), organizations that implement gamification seek to understand and influence desired behaviors in employees. Gamification increases employee engagement, learning, and perceived ease of using information systems (Stone et al., 2015). The goal of creating engaging experiences for employees and customers through the integration of social media and game-like skills has led to the increased use of gamification (Robson et al., 2015). Gamification is used to engage candidates and introduce them to the

organization's culture to validate company fit (Gupta et al., 2018). Lowman (2016) stated that gamification, which simulates a competitive, on-the-job experience, effectively attracts and retains talent. DirecTV, Nike, and Volkswagen have successfully adopted gamification strategies (Dale, 2014). The use of gamification is not limited to a specific industry.

Gamification has been used in various environments to attract and retain employees. Gamification exists in corporate settings for employee training, employee attraction and selection, and education (Fetzer, 2015). The United States Army and Deloitte are two organizations that employ gamification. The United States Army currently uses gamification to target highly skilled individuals for recruitment by allowing participants to experience firsthand combat in a game-like setting and tracking game participants' progress (Lowman, 2016). America's Army, the gaming tool, uses repetitive, interactive Army advertisements to provide training, develop the skills of individuals, and attract potential army recruits (Lowman, 2016). Deloitte, a "Big Four" accounting organization, uses a gaming tool, Firefly Freedom, to identify high-potential candidates (Savage & Bales, 2017). The smartphone app simulates a forest, and the candidate must catch fireflies to provide light for a family during winter (Savage & Bales, 2017). Savage and Bales (2017) stated that the game's objective is to test the candidate's risk level, perseverance, and ability to think and understand quickly. By deciding to capture the fireflies, with the looming risk of breaking the jar and releasing the fireflies, potential candidates demonstrate their risk level, perseverance, and mental

agility. Gamification is a valuable tool for employers and applicants to assess whether the organization or position is a good fit for the company and the individual.

Artificial Intelligence. Artificial intelligence (AI) technology is changing the recruitment and hiring process landscape. The introduction of AI in recruitment was a new trend in 2018, and AI removes unconscious bias in the resume screening process and empowers employers to choose the best candidate (Upadhyay & Khandelwal, 2018). The idea of machines learning and improving tasks based on experience was introduced in 1947 by Alan Turing (Raub, 2018). Turing, a British mathematician and logician, is the father of modern computing (Raub, 2018). According to Raub (2018), the term AI was first articulated by scientists and mathematicians at Dartmouth College in 1956. Integrating artificial intelligence technology in the recruitment and hiring of candidates has changed the traditional flow of filling job vacancies that organizations follow.

Technology-based organizations are integrating the use of algorithms into the hiring process. According to Savage and Bales (2017), 8% of U.S. companies used predictive analytics, including algorithms, in the hiring process, in 2016. Algorithms' sequential instructions for solving problems provide the foundation of AI and are used to develop models, which enable machines to make decisions. The use of algorithms for hiring has increased.

The increased use of algorithms in the hiring process can be witnessed in corporate America. Amazon, Apple, Facebook, and Google are high-tech organizations using AI algorithms to differentiate between job candidates with the same technical skills (Zehner & Zehner, 2018). AI algorithms investigate the character traits of intelligence,

imagination, initiative, interpersonal skills, and integrity for each candidate (Zehner & Zehner, 2018). The foundation for designing hiring algorithms is the past hiring data of the organization (Savage & Bales, 2017). The algorithms are purposed to inform hiring decisions and should not be the sole source for making decisions (Savage & Bales, 2017). According to Savage and Bales (2017), the past organizational hiring data is matched with the desired work traits of current employees with the data of job candidates. If a company lacks cultural diversity, the hiring algorithms will not be designed with the criteria to match the traits of the under-represented applicants with the hiring data of the current organizational employees. The use of AI algorithms in the workplace increases privacy risks for candidates because personal information, which is not related to work responsibilities, can be learned by the algorithms (Cunningham, 2016). The algorithms may subject candidates to unintentional gender or racial discrimination. Algorithm usage in the hiring process may provide efficiency for employers and present privacy risks and bias for potential employees.

Cybervetting. The increased use of technology-enabled practices has led to the decline of the use of the traditional resume as the sole determinant that employers use for hiring job candidates. Cybervetting, employers' use of social media and search engines to evaluate candidates, has become common in the hiring process (Berkelaar, 2017). Berkelaar (2017) stated that many organizations use cybervetting as a tool to gain information about the candidate, which may not appear on the resume. Employers use the traditional resume to determine a candidate's job skills, and 70% of employers use Google search engines to determine the candidate's ability to relate to others (Bolles,

2016). Job search engines evaluate the applicant's people skills and explore the applicant's online social presence. According to Berkelaar and Buzzanell (2014), employers utilize technology to conduct online screenings of applicants to assess compatibility with the organization's values. Cybervetting is an instrument used by some employers to remove potential applicants whose online personalities may not align with the organization's standards (Berkelaar, 2017). As a selection strategy, technology usage improves the efficiency of the employer evaluation process and increases employer control (Berkelaar & Buzzanell, 2014). Technology-enabled practices assist employers in choosing the best candidate for the job.

The Digital Workplace. Technological innovations have provided the foundation for the transformation of the workplace. The digital workplace is in its infancy, and only 44% of companies have adopted digital workplace tools (Attaran et al., 2019). The traditional brick-and-mortar workplace, limited by time and geography, has been upgraded to the modern, always-connected global workplace, which provides free access to the latest cloud technologies and allows for unlimited collaboration between colleagues. According to Hicks (2018), 3.7 million employees work from home, equating to 2.8% of the overall workforce.

Additionally, employees in the digital workplace can use various workplace-related technologies to complete their daily tasks. According to Byström et al. (2017), digital workplaces occur in electronic working environments instead of physical ones. High-performing companies design digital workplaces to enable employees to work more effectively and create collaborative, integrated employee experiences (Dery et al., 2017).

Dery et al. (2017) conducted a case study on three high-performing businesses that reimaged the employee experience. The organizations successfully redesigned their workplaces by integrating technologies at each company's core. Strategies used in the redesign of the organizations include the introduction of IT systems and portals for sharing knowledge and information among employees, the implementation of videoconferencing systems, the introduction of social media platforms for collaboration and communication between employees at all levels, and the empowerment of employees to make decisions as a result of the sharing of knowledge and data (Dery et al., 2017). Quality and productivity are impacted by employees not having access to the correct information to make decisions (Attaran et al., 2019). Integrating social media platforms into the digital workplace allows for effortless communication and opportunities for digital meetings, which transcends time and space (Byström et al., 2017). The traditional workplace has a new landscape, and the transformation has changed how employees conduct work.

Alternative Methods to Attract High-Potential Job Candidates

Although technology usage has impacted the recruitment process employed by many organizations, non-technical methods have proven to be successful in this digital age. According to Stone (2017), university job fairs are viable for potential IT recruits. The career aspirations of college students develop because of campus influences and practices (Binder et al., 2016). Therefore, an on-campus presence of organizations seeking to recruit potential hires may assist with employer branding and influence the

campus culture. There are a variety of strategies that organizations may use to create a campus presence.

Creating a campus presence will help companies generate awareness about their organizations while attracting potential employees. Kunttu (2017) presented a comparative, qualitative, multiple case study of nine university-industry collaborations. The university-industry collaborations included student projects, thesis projects, tailored degree courses, and jointly organized courses (Kunttu, 2017). The research findings indicated that employers benefited from collaboration by receiving new ideas from college students and transferring knowledge and skills from the classroom to the workplace and vice-versa. Students benefitted from the partnership by gaining experience and exposure to workplace practices. In a similar study, Doerschuk et al. (2016) explored strategies to recruit, retain, and transition undergraduate students in STEM through the STudents Advancing through Involvement in Research Student Talent Expansion Program (STAIRSTEP) at Lamar University in Beaumont, Texas. Strategies used in STAIRSTEP included mentoring, tutoring, outreach, exposure to STEM, and research. Researchers used a multidisciplinary approach to increase participants in STEM. The study's findings indicated that teamwork with peers and faculty helped students experience success. The study results may be used as a recruiting tool and foundation for forming university-corporate connections. Universities that participate in industry collaborations help equip their students for the workforce.

Allen (2014) conducted a study to explore the implementation of corporate universities for talent management. Talent management includes the processes involved

in attracting, developing, and retaining talent to meet the goals of an organization.

Corporate universities existed in World War II and were used to assist in the training of individuals to meet the needs of an organization. A corporate university differs from a traditional training department because the emphasis of the corporate university is to achieve the organization's mission. Allen (2014) reviewed the case study of MGM Grand Hotel and Casino in Las Vegas, Northrop Gruman Corporation, and Enclos Construction. Each organization used corporate universities, which helped with employee development, engagement, retention, and business growth. The corporate universities helped the organizations in the talent management process. The study conducted by Allen (2014) was helpful for my research because the results contributed to a body of knowledge about strategies used to attract and develop individuals for the workforce. The study results provided IT managers with new approaches to attract and develop employees. The implementation of a corporate university is expensive. However, the returns on the investment could benefit the organization and the employees.

Exposure of college students to the workplace before graduation is used by some organizations to attract potential hires. According to Gentelli (2015), university-industry relationships are increasing. There are a variety of formats for implementing university-industry relationships, including partnerships, preparation for the workforce, and research and product development. The Centre for Forensic Science at the University of Western Australia conducted a study that included integrating industry professionals in the college classroom to expose students to the workplace culture (Gentelli, 2015). The research study's findings indicated that the students valued learning opportunities from

professionals in their field of interest and recognized the importance of a link between industry and universities. The work-integrated learning environment provides opportunities for professionals to prepare students for the workforce.

Ensuring that college graduates possess the required skills for the workplace is a goal for colleges and universities. According to Tran (2016), university-industry collaborations equip the workforce and bring the workplace into the classroom. Equipping students entails acquiring the skills required to secure and retain careers (Tran, 2016). Producing graduates who possess the skills needed to obtain sought-after jobs may increase retained employees and reduce employee turnover. University-industry collaborations benefit organizations and participating students.

Relationship of This Study to Previous Research

The purpose of this qualitative, multiple case study was to explore technology-focused strategies that IT managers use to attract and retain IT professionals to meet the needs of a technology-driven workforce. During the literature review, I identified themes that determine IT managers' strategies to impact employee retention and reduce turnover positively. A detailed analysis of the topics included (a) high-tech software to attract high-potential job candidates, (b) employee retention and talent management, (c) employee retention strategies, and (d) the impact of technology on the economy. Several researchers used TTF as the conceptual framework (Chung et al., 2015; Gerhart et al., 2015; Huang & Chuang, 2016; Khan et al., 2018; Tam & Oliveira, 2016). These studies supported my research because I explored strategies to attract and retain high-tech employees. In each study, the findings indicated that when the assigned task matched the

technology used, employee performance was positively impacted and may encourage continued use of the technology. There is a positive correlation between successful employee performance and employee retention.

Kim and Ausar (2018) and Park et al. (2014) used TAM, while To et al. (2018) and Bach et al. (2016) used PU as the conceptual framework in their studies. The studies proved that the increased use of technology positively affected employee engagement and retention. The studies supported my research because I explored technology-focused strategies for attracting and retaining high-tech professionals.

Technology usage has become a norm in recruiting high-tech professionals, and several researchers conducted studies that examined technology usage as attraction and retention strategies (Dutta, 2014; Lowman, 2016; Stone et al., 2015; Upadhyay & Khandelwal, 2018). Recruitment and retention of high-tech professionals are critical for high-tech organizations (Harden et al., 2018). Zylka and Fischbach (2017) and Kim et al. (2014) conducted studies about the impact of organizations failing to retain high-performing employees. Technology usage has become a significant driver in the high-tech workforce, and I explored technology-focused strategies used to attract and retain professionals for the high-tech workforce. These studies supported my research because the findings indicated that technology usage increased engagement, decreased turnover, and helped to improve employee retention.

My research aimed to explore strategies used to attract and retain high-tech employees. In a study to examine strategies for attracting and retaining workplace talent, Lowman (2016) noted that employee engagement decreases turnover and improves

retention rates. Approaches to increase employee retention include considering employees' career goals and daily work expectations, providing training programs and employee recognition, and encouraging employee involvement in organizational decision-making (Luscombe et al., 2013). An approach to increase retention of IT professionals is to provide a hybrid career development path. This hybrid approach gives professionals the freedom to choose a career path (Biron & Eshed, 2017). According to Biron and Eshed (2017), the hybrid system may allow IT professionals to achieve career fit and decrease employee turnover (Biron & Eshed, 2017). These studies supported my research study because the findings provided strategies to decrease employee turnover and improve retention rates. To reduce employee turnover rates and increase retention, organizations must provide a clearly defined path for development.

Transition and Summary

Section 1 of this study contained information about strategies used by high-tech organizations to attract and retain highly skilled IT professionals. Components of this section included the background of the problem, the problem statement, the purpose statement, the nature of the study, the research question, interview questions, conceptual framework, operational definitions, assumptions, limitations, delimitations, and significance of the study. The academic and professional literature review includes the conceptual framework for the study. The two conceptual frameworks to inform this study are Goodhue's (1995) task-technology fit theory (TTF) and Davis' (1989) perceived usefulness (PU) theory, a component of the technology acceptance model (TAM).

Section 2 includes details about how I conducted the study. Information in this section consists of the purpose statement, the role of the researcher, participants, research method and design, population and sampling, ethical research, data collection technique, data organization techniques, data analysis, and reliability and validity.

Section 2: The Project

In this study, I explored technology-focused strategies that IT managers used to attract and retain IT professionals to meet the needs of a technology-driven workforce. I collected data from IT managers from five high-tech organizations in Atlanta, Georgia. The participating managers had implemented strategies to attract and retain IT professionals. Data collection methods included interviews, document reviews, and a demographics questionnaire. Section 2 of the study consists of (a) purpose statement, (b) role of the researcher, (c) participants, (d) research method and design, (e) population sampling, (f) ethical research, (g) data collection instruments, (h) data collection techniques, (i) data organization techniques, (j) data analysis techniques, and (k) reliability and validity. Section 3 provides the findings of this study and details of the application to professional practice and implications for change.

Purpose Statement

The purpose of this qualitative multiple case study was to explore technology-focused strategies that IT managers used to attract and retain IT professionals to meet the needs of a technology-driven workforce. The specific population for the study was IT managers from five high-tech organizations in Atlanta, Georgia, who had implemented strategies to attract and retain highly skilled IT professionals for the high-tech workforce. The potential social change impact of this study includes benefiting the economy in the local community by keeping the IT professionals employed.

Role of the Researcher

The researcher is instrumental in data analysis and data collection in a qualitative study (Clark & Vealé, 2018). The researcher collects data in the natural environment of the study participants and presents assumptions and reasons for selecting the research topic (Clark & Vealé, 2018). The researcher ensures that the study is beneficial, identifies risks to research participants, and provides confidentiality and anonymity to research participants (Roth & von Unger, 2018). Additionally, researchers ensure that participants receive ethical, respectful treatment without exploitation (Emanuel et al., 2016). According to Sutton and Austin (2015), the researcher explores the research participants' thoughts and feelings to understand how and why certain behaviors exist. As the researcher in this study, I was responsible for data collection and analysis and minimizing bias. I have prior experience with the topic because I worked as an IT professional in a major corporation and at a small, private firm in Atlanta, Georgia. I worked as an undergraduate STEM instructor in Atlanta for over 20 years. I witnessed high-tech undergraduate students accept employment within high-tech firms and switch companies within three years. I did not have a personal or professional relationship with study participants before they agreed to participate.

The *Belmont Report* includes guidelines for ensuring the protection of human subjects. The basic ethical principles of the *Belmont Report* are (a) respect for persons, (b) beneficence, and (c) justice (The National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979). To ensure adherence to the guidelines of the *Belmont Report*, I provided study participants with details about the

study. According to Pacho (2015), the informed consent process includes providing study participants with study details to decide about participation. I obtained approval to conduct the study from the Walden University Institutional Review Board (IRB). Each study participant received an emailed informed consent form, explaining the purpose, benefits, risks, and conditions for voluntary participation or non-participation. Study participants electronically signed and returned the document to indicate consent. The consent form stated the voluntary nature of the research and included the options to accept or decline the invitation. I used an interview protocol containing open-ended, predetermined questions (see Appendix A). The use of the interview protocol helped ensure consistency in question delivery and responses and limited the flexibility of the interviewer (Alsaawi, 2014). Adhering to an interview protocol is critical in research because it helps minimize interviewer effects and helps to ensure unbiased results (Ngongo et al., 2015).

Bias may impact research outcomes. According to Fusch and Ness (2015), both the researcher and the study participants can introduce bias into the study. Bias exists in all research, and it impacts the validity and reliability of the findings (Smith & Noble, 2014). According to Fusch et al. (2018), removing all bias is impossible. To mitigate bias in this study, I interviewed multiple study participants from five high-tech organizations who shared the characteristics required for study participation. I used an interview protocol with open-ended questions to guarantee consistency and minimize bias. I continued to collect data until I reached the saturation point when there was no new

information. I used member checking by allowing study participants to review the transcripts to ensure that their views had been correctly interpreted and presented.

Participants

The sampling method selected for this study was nonprobability sampling. Nonprobability sampling is defined as selecting participants in a nonrandom manner from a target population (El-Masri, 2017). The participants all shared the specific characteristics of (a) being employed as an IT manager in a high-tech Atlanta, Georgia, organization, (b) having the job responsibility of making decisions about the use of technology in the organization, and (c) being experienced with implementing successful strategies to attract and retain high-tech employees. I was responsible for gaining access to study participants because I was the sole researcher in the study.

I required strategies to gain access to participants. Høyland et al. (2015) stated that gaining initial access to participants and maintaining participant access during the study can be challenging. To gain access to the study participants, I identified five high-tech organizations in Atlanta. The organizations were determined based upon recommendations from colleagues and high-tech organizations that have established recruiting relationships within my place of employment. I had no working relationship with the hiring organizations. I selected study participants based on their IT manager role in a high-tech organization in Atlanta, Georgia. I obtained permission to conduct the study from the Walden University IRB and the human resources departments at the research sites. According to Boddy (2016), the smallest acceptable sample size of a qualitative case study is a sample size of one. Marshall et al. (2013) stated that adequate

sample size and data saturation are connected. According to Burkholder et al. (2019), three to four cases are sufficient in a multiple case study. I intended to limit this study to four high-tech organizations. However, my sample included one IT manager from each of the five high-tech organizations. The sample size was appropriate because there was enough data for reliable analysis and reporting. Data saturation is evident when the sampling techniques result in redundant data. I conducted interviews until I received redundant responses from the participating IT managers.

Barriers may exist when establishing a working relationship with participants due to their hesitancy to fully engage in the study. Rowe (2016) stated that participants might be cautious because the study may not address current issues. Participants may be critical of existing practices without providing suggestions for improving the current setting (Rowe, 2016). Open communication is key to meeting the needs of the participants and the researcher. To gain access to potential research participants, I contacted the referrals received from colleagues. I communicated with the individuals who served as the recruiting liaison and the central point of contact for the IT managers of the potential high-tech organizations. I worked to remove any barriers by establishing a working relationship with participants. According to Thurairajah (2019), the qualitative researcher needs to develop a relationship with study participants to gather data. To establish a working relationship with potential participants, I provided a consent form. I gave a detailed explanation of the study's goals and ensured the confidentiality and privacy of participants. I informed participants about my background and familiarity with this research topic. I provided open communication, addressed the concerns of participants,

and discussed the impact of attraction and retention strategies and how the results of this study may benefit IT managers.

Research Method and Design

The research method and design provided a framework for conducting the study. A research methodology is a strategy used by the researcher to find or solve a problem (Jamshed, 2014). The research methodology selected should address the research question and increase the likelihood of gaining in-depth information about the research topic (Dresch et al., 2015). Kothari (2004) stated that the research method selected should be based on the research goals. The research method defines the techniques used to conduct research; the research design provides evidence for the study (Kothari, 2004). I examined available approaches to select the best research method for this study.

Method

I explored three research methods: quantitative, qualitative, and mixed methods. According to Choy (2014), there is not a definitive best approach due to the strengths and weaknesses of the methods. I chose the qualitative research approach for this study after examining the characteristics of each approach.

Qualitative research is an in-depth exploration of a phenomenon in its natural context (Moser & Korstjens, 2017). According to Park and Park (2016), qualitative research emphasizes using observation and interpretation for discovery, based upon research questions, through field research in a natural setting. Qualitative research methods apply when a researcher seeks to understand individuals' actions and behaviors and understand a topic from participants' perspectives (Rosenthal, 2016). The qualitative

research method was appropriate because I conducted an in-depth exploration of the study phenomenon in a real-life setting. I gained the perspectives of IT managers by discussing the impact of the attraction and retention strategies they used, and I analyzed their interpretations of why they applied specific actions and behaviors.

According to Thurairajah (2019), the qualitative researcher needs to develop a relationship with study participants to gather data. I provided open communication and addressed the concerns of participating IT managers. I assured the participants that the research findings would be presented as attraction and retention tools. Qualitative research includes various sources of data, such as interview transcripts, newspaper articles, questionnaires, diaries, videos, or field observations (Castleberry & Nolen, 2018). Qualitative data can help researchers understand and explain the reasons behind attitudes and behaviors (Lauri, 2019). I selected qualitative research because I utilized interviews to gather data.

I considered conducting a quantitative study. The goal of quantitative research is to quantify a theory or a problem (McCusker & Gunaydin, 2015). Quantitative researchers gather numerical data to establish correlations between variables and outcomes (Choy, 2014). Qualitative researchers test statistical significance to reject the null hypothesis and verify the study's findings (Trafimow, 2014). I did not choose the quantitative research method because I did not collect numerical data. Because I did not emphasize the statistical analysis of variable relationships, I concluded that the study did not warrant a quantitative approach.

Mixed-methods researchers combine quantitative and qualitative research techniques in a single study to add reliability and significance to study outcomes (Ivankova & Wingo, 2018). Also known as a multistrategy research, mixed-methods research features both quantitative and qualitative components (Stahl et al., 2019), which allows it to provide a better understanding of the study phenomenon (McChesney & Aldridge, 2019). Mixed-methods research includes answerable information using qualitative and quantitative methods (McChesney & Aldridge, 2019). The mixed-methods research was not ideal for this study because there were no numerical factors to quantify. Because the study involved a phenomenon in a natural setting, needed an in-depth exploration, and did not include statistical data, I chose the qualitative research method.

Research Design

I chose a multiple case study design for this study. A case study is an intensive study about a person, a group of people, a thing or other entity. The researcher asks open-ended questions and examines in-depth data to gain insight and understanding of a phenomenon in the natural setting (Heale & Twycross, 2018). Case study researchers may build theory, add detail to theory, and investigate a real-life phenomenon without controlling conditions within a certain environmental context (Ridder, 2017). In the case study design, the researcher acts as an instrument in gathering information within the environment being studied (Alpi & Evans, 2019). Case study research provides a detailed analysis of the experience of study participants in a specific context (Pacho, 2015). A multiple case study design is applicable when more than one case will provide a better

understanding of the phenomenon being investigated (Heale & Twycross, 2018). The multiple case study design was appropriate for this study because I used more than one case to explore the many aspects of attraction and retention strategies used by IT managers, within the bounds of five high-tech organizations, in Atlanta, Georgia. Besides the case study design, I considered ethnography and phenomenology.

The ethnographic researcher becomes a participant in the environment to understand the environment's culture, practices, and experiences (Simpson et al., 2014). Ethnographic researchers immerse themselves within a setting to understand the behaviors of the individuals within the environment (Brown, 2014). Ethnographic researchers spend extended periods within the environment to learn from the experiences of the individuals in the setting (Palmer et al., 2018). The focus of my study was to explore technology-focused strategies that IT managers used to attract and retain IT professionals and not to study a cultural group in the organization. Additionally, the study of technology-focused strategies did not require me to immerse myself in the environment during the study. Therefore, I did not select an ethnographic design for the research.

A phenomenological researcher describes how humans experience a phenomenon (Sousa, 2014). Phenomenological studies involve the exploration of the primary significance of an encounter shared by individuals in a specific setting (Hancock & Algozzine, 2017). According to Wilson (2015), phenomenological researchers interpret the meaning of the experience of individuals who have lived the phenomenon. I did not select phenomenological design because the focus of my study was on strategies used to

attract and retain highly skilled IT professionals. The focus of the research was not on the participants' experiences. Because I used more than one case to investigate the many aspects of attraction and retention strategies used by IT managers, I chose the multiple case study design.

Data saturation is an important research component and is a goal of the qualitative researcher. According to Fusch and Ness (2015), failure to achieve data saturation negatively impacts the quality of the research and the validity of study findings. Because research study designs vary, there is no universal guideline to determine when data saturation has been reached (Fusch & Ness, 2015). Data saturation occurs when additional data collection results in no new information being collected (Saunders et al., 2018). According to van Rijnsoever (2017), to achieve data saturation, data collection and analysis should continue until no new concepts materialize. The researcher attains data saturation when the results are capable of a degree of generalization (Boddy, 2016). Data collection persisted until saturation occurred when I received redundant responses from the IT managers.

Population and Sampling

A population is a group of individuals who share characteristics of interest and is the subject of and is the primary source of data for a study (Asiamah et al., 2017). The target population for the study was limited to IT managers from five high-tech organizations in Atlanta, Georgia. The IT managers used technology-focused strategies to attract and retain high-tech employees. Like Naqvi and Bashir (2015), the target population included experienced managers of IT departments who used attraction and

retention strategies for highly skilled IT professionals. According to Asiamah et al. (2017), IT managers could support the research study's most accurate information. Therefore, the population of IT managers was selected for the study.

Sample selection and size strengthen a study and determine whether research questions are answerable (Shorten & Moorley, 2014). The two main types of sampling techniques are probability sampling and non-probability sampling. With probability sampling, every element in the population has an equal chance of being included in the sample (Wilson, 2014). According to Shorten and Moorley (2014), the random selection of study participants occurs with probability sampling. Samples selected using probability samplings are representative of the population (Elfil & Negida, 2017). Probability sampling techniques were not chosen because probability sampling results in numeric data, and there were no numerical factors to quantify in the study. Additionally, the participants for this study were not randomly selected, and all participants shared the specific criteria for participation. The sampling method chosen for this study was a non-probability sampling technique.

Nonprobability sampling is nonrandomly selecting participants from a target population (El-Masri, 2017). The probability of participant selection is not calculable. Nonprobability sampling is a technique that does not give all participants in a population an equal chance of being included in the study (Etikan, 2016). For nonprobability sampling, either the researcher determines the participants for the study or the participants self-select for inclusion in the study (Link, 2018). Self-selection can positively impact the study by reducing the time required to gather participants and may

increase the willingness of participants to add insight into the study (Sharma, 2017).

According to Shorten and Moorley (2014), two qualitative sampling approaches include (a) convenience and (b) purposive/judgmental.

Convenience sampling is a nonprobability sampling technique. Convenience sampling occurs when the researcher's homogeneous target population is easily accessible (Etikan, 2016). The physical location of the target population is in the desired geographic location, and participants are readily available and willing to participate in the study (Etikan, 2016). Convenience sampling is quick, inexpensive, and convenient because the participants are selected based on accessibility, location, and availability (Elfil & Negida, 2017). Convenience sampling is subject to selection bias because the researcher's participants are self-selected or chosen based upon researcher-defined characteristics (Etikan, 2016). Emerson (2015) stated that convenience sampling helps the researcher to obtain the desired study participants and can easily influence the study outcome because of the similar nature of the study participants. The researcher and study participants introduce bias in a study. The researcher must be aware of their perspective and the participants' views (Fusch & Ness, 2015). Bias may occur because self-selected participants may distort the data (Sharma, 2017). The target population in convenience sampling may not represent the population (Etikan, 2016; Sharma, 2017).

Purposive sampling, also known as judgmental sampling, is a nonrandom sampling technique in which the number of study participants is not set (Etikan, 2016). After the purpose of the research is determined, a predetermined target group is selected, and the size of the sample depends upon the targets of the study (Apostolopoulos &

Liargovas, 2016). Like convenience sampling, the target population in purposive sampling depends upon the judgment and selection of the researcher. According to Setia (2016), the researcher deliberately selects research participants to answer the research questions in purposive sampling. Because the researcher chooses the research population, purposive sampling is subject to bias (Sharma, 2017). Purposive sampling provides various non-probability sampling techniques to justify researcher generalizations from the sample in the study (Sharma, 2017). Purposive sampling was suitable for this study because I explored technology-focused strategies that IT managers used to attract and retain IT professionals. I selected a pre-determined target population of participants who shared the specific characteristics of (a) being employed as an IT manager in a high-tech Atlanta, Georgia organization, (b) having the job responsibility of making decisions about the use of technology in the organization, and (c) experienced with implementing successful strategies to attract and retain high-tech employees.

There are no clear standards for sample size in qualitative research (Marshall et al., 2013). Etikan (2016) stated that there is no set number of study participants in purposive sampling. The size of the sample, in purposive sampling, is based on the targets of the research (Apostolopoulos & Liargovas, 2016). Similarly, sampling size is irrelevant with a multiple case study design because sampling logic is not used (Yin, 1994). According to Cleary et al. (2014), the qualitative researcher can justify the sample size based on quality data and use the participants the data represents. According to Malterud et al. (2016), the targeted sample size depends on the aim of the study. A comprehensive study with a broad aim requires a larger sample size (Malterud et al.,

2016). A narrow study aim will need the researcher to limit the number of eligible study participants (Malterud et al., 2016). General guidelines for a multiple case study design exist; however, there is no set range for the number of samples (Marshall et al., 2013). The adequate sample size connects to data saturation when the sampling techniques result in redundant data (Marshall et al., 2013). For this study, I utilized five high-tech organizations, with one IT manager in each organization. The selection process of participants in this study depended upon participants all sharing the specific characteristics of (a) being employed as an IT manager in a high-tech Atlanta, Georgia organization, (b) having the job responsibility of making decisions about the use of technology in the organization, and (c) being experienced with implementing successful strategies to attract and retain high-tech employees. Interviews continued until I received redundant responses from the IT managers as data saturation had occurred.

Ethical Research

Researchers must protect research participants and safeguard the study's integrity, value, and validity. Resnik (2015) defined ethics as guidelines for conduct that differentiate between standard and nonstandard behaviors. According to Kendall and Halliday (2014), aspects of ethical research include informed consent, minimizing harm, and privacy and confidentiality.

Research participants should be informed about the risks and benefits of a research study. The standard rule is a rule of ethics that requires researchers to inform human subjects before participating in research and provides research participants the right to freely withdraw from the study without penalty (Ross, 2019). Informed consent is

a legal, ethical, and regulatory requirement for research (Grady, 2015). The informed consent process includes providing study participants with participation details (Pacho, 2015). According to Pacho (2015), factors of the study include an explanation of the purpose, benefits, risks, and conditions for voluntary participation or non-participation in the study.

I obtained approval to conduct the study from the Walden University IRB. I emailed each study participant an emailed informed consent form, which explained the purpose, benefits, risks, and conditions for voluntary participation or non-participation in the study. Study participants electronically signed and returned the consent document to consent to the study. The consent form included the voluntary nature of the research. The consent form informed participants of the options to accept or decline the invitation. Participants were able to express the desire to withdraw from the study, at any time, by sending a notification email to me.

Incentives are monetary or non-monetary gifts provided to participants for participating in a study. Research studies indicate that offering incentives produces higher participation rates (Kelly et al., 2017). Kelly et al. (2017) experimented with testing the impact of incentives on willingness to participate in a qualitative interview. The researchers used motivation categories of no incentive, non-monetary incentives, and monetary incentives. The study findings indicated that financial incentives resulted in a greater willingness to participate than the other types of incentives (Kelly et al., 2017). However, I did not provide a monetary incentive to participants.

I was responsible for protecting research participants. Emanuel et al. (2016) outlined seven principles to safeguard research participants: (a) social value, (b) scientific validity, (c) fair subject selection, (d) favorable risk-benefit ratio, (e) independent review, (f) informed consent and (g) respect for the enrolled subject. The study has social value because it offers insight on how to improve the well-being of the target population and provides strategies to keep highly skilled IT professionals employed. The findings of this study may contribute to scientific validity by adding to the body of knowledge about the technology-focused methods that IT managers used to attract and retain highly skilled IT professionals. The target population was limited to IT managers from five high-tech organizations in Atlanta, Georgia, who used technology-focused strategies to attract and retain high-tech employees. The purpose of the population restriction was to ensure fair subject selection. The risk-benefit ratio of the study was favorable because the burden of participating in the research was minimal for the target population due to the use of qualitative interviews.

The study was subject to independent review to confirm that the research satisfied the seven ethical principles outlined by Emanuel et al. (2016). The Walden University IRB provided permission to conduct the study before I began. Participants gave informed consent by agreeing to the outlined conditions: (a) they have the mental capacity to self-authorize participation in the study, (b) they fully understand all aspects of the study, (c) they will receive full disclosure of all facts regarding study participation and study risks, and (d) they understand that participation is voluntary and know the methods to end study participation. I maintained the confidentiality of the participants. I informed participants

the research findings and were allowed to voluntarily end study participation. In January 2017, I completed the National Institutes of Health's Office of Extramural Research's web-based training course, "Protecting Human Research Participants," to assure that the ethical protection of participants was adequate and to ensure that I was knowledgeable about the principles of the *Belmont Report*. The certificate of completion for the course is included in Appendix B.

Adequate ethical protection of participants is the responsibility of the researcher. The researcher must ensure participants' safety, rights, and welfare (Grady & Faucy, 2016). Virtues that contribute to participant protection include: (a) integrity, (b) trustworthiness, (c) discernment, (d) conscientiousness, (e) compassion, and (f) intellectual honesty (Grady & Faucy, 2016). I informed participants of any bias, notified the IRB of potential conflicts of interest, demonstrated trustworthiness by accurately recording and reporting responses, and provided honest, detailed study findings.

The data retention plan includes protecting the rights of participants. Providing storage for all signed consent forms and study artifacts for five years in Google Drive is a component of the data retention plan. Google Drive is password-protected and encrypted using Secure Socket Layer (SSL). After five years, data destruction will occur. The data retention plan will follow the requirements outlined by Walden University.

Confidentiality is a core tenet of research ethics (Surmiak, 2019). According to Grosseohme (2014), the researcher should ensure that research participants remain anonymous and that the privacy of participants' data is maintained. Researchers are obligated to safeguard entrusted information to protect participants and prevent harming a

specific community's reputation (Turcotte-Tremblay & Mc Sween-Cadieux, 2018). The linkage of information to participants increases the risks to participants (Francis & Francis, 2014). I used nonidentifiable code implementation to protect the names of individuals or organizations and keep the participants and organizations confidential. Access to identifiable information was limited to me.

Data Collection

Instruments

Accurate data collection is a fundamental component of qualitative research (Ranney et al., 2015). The U.S. Department of Health and Human Services (2019) noted that data collection is the process of gathering and measuring information to answer research questions accurately. In qualitative studies, the researcher is responsible for evaluating and interpreting what is observed (Sanjari et al., 2014). Clark and Vealé (2018) also noted that the researcher is the primary instrument used for data collection and analysis in qualitative research. As a qualitative researcher, I was the primary data collection instrument. My primary data collection technique was semistructured interviews, and the secondary data collection technique was document review. Semistructured interviews include using an interview protocol with predetermined questions and allow for follow-up questions (Grossoehme, 2014). I used the interview protocol (see Appendix A) while conducting the semistructured interviews. The interview protocol helped me to understand the experiences of research participants who used attraction and retention strategies with highly skilled IT professionals. According to Castillo-Montoya (2016), the interview protocol is a systematic approach to interviewing,

which can be used as a checklist to ensure that all essential questions that align with the study are addressed. I used the interview protocol to guide the interviews because it contained open-ended, pre-determined questions related to my research. The use of the interview protocol limited my flexibility in questioning participants and helped to ensure that I was consistent in question delivery (Alsaawi, 2014). The essential components of a data collection protocol include: (a) developing a collection strategy, (b) identifying the sampling population, and (c) obtaining the detailed data in a reproducible manner (Ranney et al., 2015).

Cypress (2017) noted that reliability and validity often refer to quantitative research. Bolarinwa (2015) defined validity in quantitative research as the degree to which an instrument measures what it claims to measure and defines reliability as the degree to which the results are reproducible. Leung (2015) stated that validity is the appropriateness of the tool for the study related to the research question, design, sampling, data analysis, results, and conclusions for the framework. In quantitative research, dependable data collection that is reproducible and consistent will produce repetitive outcomes (Ellis, 2018). According to Cypress (2017), validity and reliability apply to quantitative research, and the qualitative equivalent is trustworthiness. The methodologies, criteria, and terminology used in quantitative and qualitative research differ (Cope, 2014). According to Cope (2014), rigor and validity are the frames of reference for quantitative research, and trustworthiness and credibility are the frames of reference for qualitative research. The truth value of qualitative research is

trustworthiness (Cope, 2014). Quality, authenticity, and truthfulness in findings are terms used to refer to trustworthiness (Cypress, 2017).

Connelly (2016) noted that credibility is equivalent to internal validity in quantitative research. According to Thomas (2017), member checks enhance the credibility or validity of research findings. Member checking allows study participants to review the researcher's interview interpretations to ensure accuracy (Lo, 2014).

According to Korstjens and Moser (2018), member checking strengthens the data because respondents and participants can confirm that views have been correctly interpreted and presented. I employed member checking before publishing the research findings to enhance the study's credibility. I used member checking by re-interviewing study participants. Using the interview protocol helped to ensure consistency in question delivery. I confirmed that I correctly interpreted and reported the responses provided during the initial consultation during the follow-up interviews. I did not need to modify the transcripts to gain approval from participants.

Data Collection Technique

Interviews, focus groups, and observations are standard techniques for qualitative data collection (Halcomb, 2016). According to Grosseohme (2014), researchers conduct semistructured interviews using an interview protocol, which includes predetermined questions and allows for follow-up questions. According to Wilson (2016), the guiding questions used with semistructured interviews help to keep the conversation on track. Interviews can be conducted in various formats, including face-to-face, electronically, or over the telephone (Wilson, 2016).

To determine the appropriateness of interviews for this qualitative study, I researched the importance of the interview setting to interview outcomes. Dawson et al. (2017) conducted a study to determine if the physical setting of an interview impacted the willingness of participants to disclose information. The research findings indicated that larger open spaces promote openness during interviews (Dawson et al., 2017). Interviews are the most common form of data collection in qualitative research (Jamshed, 2014). An interview involves a one-to-one conversation between the research participant and the investigator, who questions and controls the discussion (Nyumba et al., 2018). According to Abbe and Brandon (2014), the interviewer should establish rapport with the participants to positively impact interviewing and enhance the interviewees' openness. Face-to-face interviews help prevent misunderstandings and ensure privacy (Hilgert et al., 2016). Interviewers should conduct interviews in a private setting to ensure privacy and avoid interference with interviewees' responses (Mneimneh et al., 2015). The four types of qualitative interviews are: (a) structured, (b) semistructured, (c) unstructured, and (d) focus group discussions (Alsaawi, 2014). The researcher uses an interview protocol in a structured interview. A structured interview includes a set of strict, predetermined questions (Grossoehme, 2014). Structured interviews are focused and are used to ensure consistency in question delivery and responses and limit the flexibility of the interviewer (Alsaawi, 2014). Semistructured interviews are conducted using a predetermined interview protocol and follow-up questions (Grossoehme, 2014). According to Alsaawi (2014), the open-ended questions used in semistructured interviews enable the interviewee to provide detailed responses. Unstructured interviews

are informal conversational, and the interviewer does not use predetermined questions (Jamshed, 2014). The interviewer immediately generates questions in unstructured interviews (Jamshed, 2014). A focus group is a group interview or collective conversation that consists of 6 to 8 homogeneous participants, selected using purposive sampling (Ryan et al., 2014). The researcher facilitates the discussion between study participants in a focus group (Nyumba et al., 2018). The focus group facilitator uses open-ended questions to gather detailed responses from participants (Rosenthal, 2016). Focus groups provide data that relies on group interactions to answer the research questions for the study (Rosenthal, 2016). The semistructured interview was the chosen data collection technique for my research. I used pre-determined, open-ended questions to receive detailed, one-on-one responses from study participants.

I conducted semistructured interviews using an interview protocol (see Appendix A). To access the study participants, I identified IT managers from five high-tech organizations in Atlanta. I contacted the referrals received from colleagues. I communicated with the individuals who served as the recruiting liaison and the central point of contact for the IT managers of the potential high-tech organizations to explain the purpose of the research study and request access to IT managers. I selected study participants based on their role as IT managers in a high-tech organization in Atlanta, Georgia. I obtained permission to conduct the study from the Walden University IRB. I emailed each study participant an emailed informed consent form, which explained the purpose, benefits, risks, and conditions for voluntary participation or non-participation in the study. To consent to the study, study participants electronically signed and returned

the consent portion of the form. The consent form included information about the voluntary nature of research participation and the right to accept or decline the invitation. Once I received consent from the participants and permission from the Walden University IRB, I scheduled the virtual interview times with each research participant.

There are advantages and disadvantages associated with conducting interviews for data collection. According to Wilson (2016), face-to-face interviews enable the researcher to monitor each participant's body language and facial expressions. There are advantages of semistructured, face-to-face interviews. According to McIntosh and Morse (2015), non-verbal communication is possible with semistructured interviews. Additionally, the interviewer may clarify questions (McIntosh & Morse, 2015). Non-verbal communication provides clues to the researcher regarding the participant's comfort level in responding to the type of research questions included in the study. The personal interaction between the researcher and the study participant, in a face-to-face interview, may have the contrasting effects of increasing the comfort level of the study participant with the researcher or may lead to the discomfort of the study participant with the researcher (Rahman, 2015). Additionally, face-to-face interviews may lead to response bias and increased anxiety among research participants due to the researcher's presence (Rahman, 2015). According to Brown (as cited in Alshenqeeti, 2014), a summary of the advantages and disadvantages of interviewing is provided in Table 1.

Table 1*Advantages and Disadvantages of the Interviewing Approach*

Advantage	Disadvantage
High return rate	Time-consuming
Fewer incomplete answers	Small scale study
Can involve reality	Never 100% anonymous
Controlled answers	Potential for subconscious bias
Relatively flexible	Potential inconsistencies

Note. I prepared this table using information from Alshenqeeti (2014).

As shown in Table 1, Alshenqeeti (2014) noted that face-to-face interviews might lead to the subconscious bias of research participants. Fusch and Ness (2015) remarked that both the researcher and the study participants introduce bias in the study. The researcher must be aware of their perspective, as well as the views of the participants (Fusch & Ness, 2015). Member checking reduces the potential for researcher bias (Birt et al., 2016).

To reduce researcher bias in this study, I used member checking. Member checking consists of verification and review of transcripts by study participants of the accuracy of the researcher's interpretation of the interview results (Varpio et al., 2017). According to Iivari (2018), it is common to involve study participants after data collection to check the researchers' interpretation, correct errors, and reassess their viewpoints. Participants must verify the accuracy of the researcher's understanding of the

interview results and review the data analyses to validate the researcher's interpretations of the study findings (Varpio et al., 2017). Member checks help establish the trustworthiness of research findings by requesting the perspective of study participants and allowing the researcher to interpret participants' experiences (Kornbluh, 2015). The process allows study participants to confirm the accuracy of responses included in the study (Birt et al., 2016). The goals of member checking are to correct errors and eliminate misrepresentation of research findings. The member checking process helped to confirm the accuracy of the participants' responses and provided trustworthiness to my study findings. Member checking and document review were techniques selected to assist in data triangulation.

I used document review as a secondary method of data collection to aid in triangulation in my research. According to Zeegers and Barron (2015), triangulation attempts to gain more than one perspective on the study. With triangulation, researchers validate study findings and lessen biases in a single study (Bowen, 2009). There are several steps involved in the iterative document analysis process.

I used document review to evaluate documents to contribute to the trustworthiness of a research study. O'Leary (2014) provided a detailed checklist for document analysis, depicted in Figure 2. When planning to conduct document analysis, I requested the participants to give printed or online materials that they have used to attract and retain IT professionals. Although participants did not provide company-related documents to support the study, some participants directed me to online resources used by their organization to attract and retain high-tech personnel. I analyzed the online resources and

organized them based on the related themes of the content. I reviewed the materials to determine whether bias existed from the perspective of the resources' creators and the researcher's interpretation. I thoroughly examined the resources and decided the purpose of each text's materials and messages. I did not need additional documents at this stage, and I did not repeat the previous steps. In the final phase of the iterative cycle, I began the data analysis process.

Figure 2

Steps to Conducting Document Analysis



Note. Created by this researcher based on the essential guide to doing your research project (O’Leary, 2014).

According to Rich (2019), document analysis is a systematic process of finding, selecting, reviewing, and interpreting documents to discover meaning related to the research problem. Documents are pre-produced texts that the researcher did not generate, and the researcher's role is to gather, review, and analyze the documents (O'Leary, 2014). Document review is a universal data collection approach, and materials, such as institutional records and public documents may be used as secondary data for the study (Cleland, 2017). The goal of document analysis is the understanding of the contents of the document through a detailed examination of the record (Gorichanaz & Latham, 2016). According to Siegner et al. (2018), document analysis provides background information and study credibility and brings additional information to the study. Document review and semistructured interviews were the selected data collection techniques for this study because they allowed data collection to support the research question.

Data Organization Techniques

According to Broman and Woo (2018), consistency is the first rule for data organization. Franklin et al. (2018) stated that a systematic approach to the organization would help to ensure consistency across multiple data sites. With a consistent organization approach, differences in research results will be related to the participants and not to the process (Franklin et al., 2018). Techniques to protect participants' identities include using pseudonyms instead of naming participants and replacing identifiable information with numbers (Saunders et al., 2015). To remove identifiers from research participants and locations, I used the pseudonym RESP for each respondent, followed by

the sequential participant response order. The identities of individual participants and the location sites of the study were not shared. I used the consent form to receive permission to audiotape each participant's interview. According to Widodo (2014), transcribing interviews is a qualitative research activity. Software, such as NVivo, may be helpful in logically organizing semistructured interview data (Young et al., 2018). NVivo can be used to classify, sort, and organize interview transcripts (Sotiriadou et al., 2014). I used NVivo software as a tool to organize data. I will ensure data security by storing all signed consent forms and study artifacts for five years in Google Drive. Google Drive is password-protected and encrypted using Secure Socket Layer (SSL). After five years of retention, data destruction will occur. The data retention plan will follow the requirements outlined by Walden University.

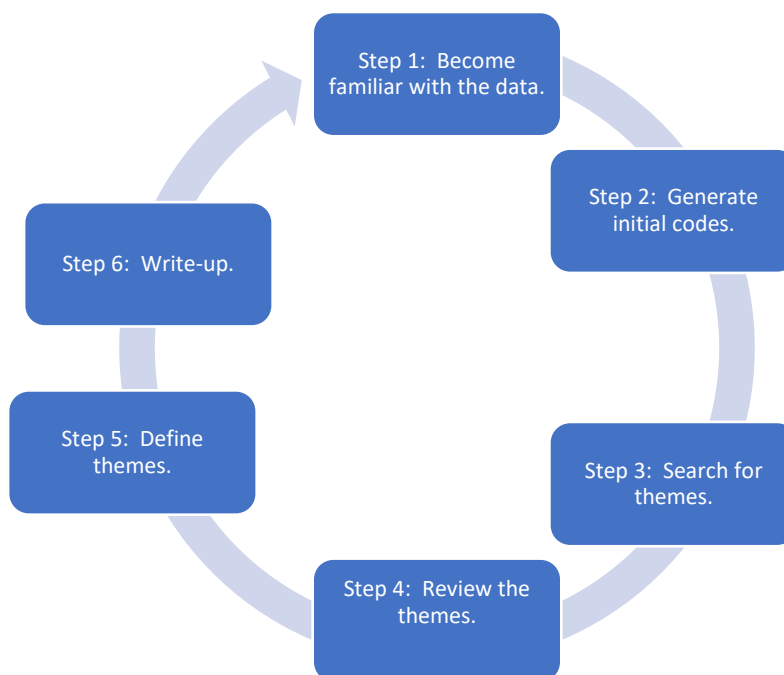
Data Analysis Technique

Thematic analysis (TA) is a conventional data analysis technique in qualitative studies (Castleberry & Nolen, 2018). According to Crowe et al. (2015), TA enables the researcher to capture meanings within the data, and it usually involves interviews as a data collection technique. TA can be used to analyze data sets that vary in size and the types of data samples (Clarke & Braun, 2017). It is a flexible data analysis strategy used to interpret and identify patterns and themes in qualitative data (Maguire & Delahunt, 2017). TA ends when the researcher identifies themes that represent prominent patterns in the data (Richards & Hemphill, 2018). According to Clarke and Braun (2017), themes provide the structure for classifying and reporting the researcher's observations. They

define a theme as a recurring feature in the data set that captures essential information concerning the research question. According to Braun and Clarke (as cited in Maguire & Delahunt, 2017), there are 6-steps to conducting thematic analysis, included in Figure 3.

Figure 3

Six Steps to Conducting Thematic Analysis



Note. Created by this researcher based on concepts in *Doing a thematic analysis: A practical, step-by-step guide for learning and teaching scholars* (Maguire & Delahunt, 2017).

Figure 3 illustrates the six steps to conducting a thematic analysis. I used the thematic approach to analyze the data. After collecting the data by conducting interviews, I began the first phase of thematic analysis, familiarizing myself with the data (Maguire & Delahunt, 2017). I listened to the recording of each interview and transcribed the results using the audio transcription tool in Zoom. Next, I continuously reviewed the

transcripts to understand each participant's responses. I considered the common phrases and terms that I heard participants say. According to Nowell et al. (2017), repeated reading of the data while searching for meanings and patterns will help the researcher to become immersed in the data. When the researcher becomes immersed in the data, it is possible to identify and record data features related to the research question (Clarke & Braun, 2014). I immersed myself in the data by repeatedly reviewing the interview transcripts to ensure that I was knowledgeable about the content of the data. Once the data were transcribed, I used member checking to verify with participants that my interpretations were accurate. I repeated this process until all participants approved my interview interpretations. Next, I generated codes from the analyses.

I reviewed the repeated transcript phrases and developed a code for the common terms. Coding is a popular data analysis technique used to denote what is presented in a portion of text and may take the form of numbers, a word, short phrases, or mnemonics to summarize the data (Gläser & Laudel, 2013). The purpose of coding is to sort and organize data to find relationships between data that have similar meanings and to assist the researcher in determining the derived meaning from the data as it relates to the research question (Stuckey, 2015). Clark and Vealé (2018) noted that summarizing the data without losing the meaning of the original transcript is the goal of coding. Coding, which was once a manual process, can now be efficiently managed using qualitative data analysis software (Chowdhury, 2015). There are a variety of software packages that researchers use to organize data. NVivo is the QDAS software that I used to manage the data from my interviews.

I used the QDAS software, NVivo, to assist with data analysis to code the data. According to Leitch and Oktay (2016), QDAS can be useful for entering, coding, organizing, and importing data. Cypress (2019) stated that using QDAS saves the researcher time and provides increased flexibility. QDAS allows the researcher to manage data more efficiently. Using NVivo assisted me in identifying themes that were related to the research topic. According to Chowdhury (2015), the software cannot analyze or interpret the data, and the researcher is responsible for deciphering meaning from participants' narratives (Chowdhury, 2015). After identifying the themes, I reviewed the ideas to confirm a fit between the identified themes and the research topic. I continued with the thematic analysis approach and wrote the report.

The final phase of TA involves writing the analysis results by reporting on the themes identified during the previous 5 phases. Although stage 6 is the writing of the report phase, writing is a fundamental component of TA, which begins before stage 6 (Braun et al., 2016). According to Braun et al. (2014), writing the report involves the researcher providing details about the data and making an argument to answer the research question. To increase the validity of the information and to assist in validating the themes chosen for the study, researchers should use quotes from the study participants (Nowell et al., 2017). According to Nowell et al. (2017), submitting the report analyses to study participants will ensure the accuracy of views and interpretations. To write the report, I included the details of the previous steps of TA, and I incorporated member checking to allow participants to confirm the accuracy of my interpretations. Researchers use TA to understand an organization or group, and the findings of the analysis may be

used as tools for decision-makers to make interventions (Wang et al., 2018). I used TA to understand strategies used by IT managers to attract and retain high-tech employees. The findings of this study may assist IT managers in developing or adopting strategies to attract and retain high-tech employees. I used interviews to collect data and follow the sequential TA process.

Reliability and Validity

Reliability

Reliability is the degree to which the research study results are reproducible (Bolarinwa, 2015). According to Ardhendu (2014), the focus of reliability is to minimize errors and biases in the study. To prove the research's reliability and enable other researchers to replicate the research procedure, the researcher must document the research process in the final report (Ardhendu, 2014). Quantitative researchers apply statistical methods to establish the reliability and validity of research findings (Noble & Smith, 2015). Qualitative researchers design strategies to ensure the trustworthiness of research findings (Noble & Smith, 2015). Trustworthiness is related to a qualitative research study (Ellis, 2016). Cope (2014) noted that trustworthiness is the truth value of qualitative research. To ensure the study's reliability and trustworthiness and enable other researchers to replicate the research, I documented all steps of the research procedure. The quality criteria for all qualitative research include dependability, credibility, transferability, and confirmability (Korstjens & Moser, 2018).

Dependability

In qualitative research, dependability refers to research findings that are consistent and documented (Moon et al., 2016). Dependability is confirmation that data analysis and research design align (Korstjens & Moser, 2018). Hagood and Skinner (2015) noted that dependability is an agreement between data collection methods, research objectives, setting, and artifacts. According to Tong and Dew (2016), researchers achieve dependability when the process is logical and transparent. To ensure dependability, the researcher must provide an audit trail, which includes detailed documentation of the research process and the decisions made during the research (Korstjens & Moser, 2018). To ensure the dependability of the study findings, I provided an audit trail, which included detailed documentation of the research process and the decisions made for this study. During the follow-up interview with study participants, I employed member checking to correctly interpret and report the responses provided during the initial consultation. I also used the interview protocol to ensure consistency in question delivery with each study participant. Because all participants were asked the same questions with the interview protocol, the dependability of my interpretations was strengthened when participants provided similar responses.

Credibility

Validity is the degree to which an instrument measures what it claims to measure (Bolarinwa, 2015). According to Korstjens and Moser (2018), credibility is equivalent to internal validity. Credibility is confidence in the trustworthiness of the research results, based on the experiences of study participants (Hagood & Skinner, 2015). Research

findings are authentic when the results are reproducible and replicable (Mendes-Da-Silva, 2019). Credibility is an alignment between the research design, the data, and the accuracy of the research findings (Ellis, 2018). A study has credibility if the results can be trusted (Tong & Dew, 2016). According to Korstjens and Moser (2018), member checking and triangulation are strategies used to ensure credibility. To ensure the study's credibility, I guaranteed that study participants met the criteria for study participation. I conducted semistructured interviews, which allowed me to ask open-ended questions and allowed study participants to add additional information that I may have omitted. After the initial consultation, I employed member checking by following up with study participants. I allowed the study participants to confirm that I correctly interpreted and reported the responses provided by participants during the initial interview.

Member checking is a technique used to establish validity (Brear, 2019). According to Solomon and Amankwaa (2016), member checking is essential for establishing credibility. Member checking strengthens the data because study participants can ensure that views have been correctly interpreted and presented (Korstjens & Moser, 2018). According to Miles et al. (2014), member checking may help identify errors in data representation and researcher bias. I used member checking to ensure the accuracy of research participants' views.

Triangulation is a process of using multiple data collection techniques and data sources to create a comprehensive understanding of the phenomenon (Ellis, 2018). According to Ellis (2018), triangulation allows for comparing, contrasting, and verifying the findings. This strategy usage tests the validity of results by merging information from

different sources (Carter et al., 2014). Triangulation increases validity and reliability by strengthening research findings and reducing the risk of false interpretation (Mishra & Rasundram, 2017). Triangulation is also a strategy used to reduce the effect of researcher bias (Gunawan, 2015). According to Fusch and Ness (2015), both the researcher and the study participants introduce bias into the study. However, it is impossible to remove all bias (Fusch et al., 2018). Triangulation can increase the credibility and validity of study results by overcoming the deficiencies of single-method studies (Mishra & Rasundram, 2017). To increase the reliability and validity of the study, I used triangulation.

Triangulation was evident because I conducted semistructured interviews with multiple study participants. I compared the consistency of the participants' responses. I reduced the risk of false interpretation by implementing member checking by allowing study participants to review the interview interpretations after the initial interview. I also conducted document analysis by requesting the participants to provide printed or online materials used to attract and retain IT professionals. Although participants did not produce company-related documents to support the study, some participants directed me to online resources used by their organization to attract and retain high-tech personnel. I analyzed each online resource provided.

Transferability

Transferability is the ability of the researcher to connect the research findings to the theory and apply the results of the study to other settings (Hagood & Skinner, 2015). Transferability is evident when non-participants find the results meaningful and relate the study results to their own experiences (Cope, 2014). Tong and Dew (2016) asserted that

transferability is evident when the findings are relevant to other contexts. A strategy to facilitate transferability is providing extensive details about the study to non-participants (Solomon & Amankwaa, 2016). Providing comprehensive information to non-study participants will assist in making decisions about the applicability of the findings to other settings (Solomon & Amankwaa, 2016). The dissemination of the research findings to IT managers, not included in the study, will ensure that transferability has been attained and can inform about successful strategies to attract and retain skilled professionals for the high-tech workforce. The sharing of research with personnel in colleges and universities who want to increase university-industry collaborations and guarantee that college graduates possess the high-tech skills needed for the labor force may increase the transferability of the study.

Confirmability

Confirmability is evidence that the findings of the study lack researcher bias (Hagood & Skinner, 2015). Hagood and Skinner (2015) stated that the results are the participants' reported experiences. There are several components to establishing confirmability. To determine confirmability, include triangulation, provide an audit trail of research activities, and develop a reflexive journal (Solomon & Amankwaa, 2016). A reflexive journal includes detailed entries about the researcher's decisions, perspectives, and beliefs during the research process (Solomon & Amankwaa, 2016). Because the researcher's views can impact the research study, integrating reflexive journaling is an activity to legitimate and validate the research procedure for the study (Mortari, 2015). According to Tong and Dew (2016), researchers achieve confirmability when links exist

between the findings, interpretations, and data. A relationship should not exist between the researcher and the data (Tong & Dew, 2016). To minimize bias and achieve confirmability, I included the following activities in the research process: triangulation, an audit trail, and reflexive journaling. I used triangulation by conducting semistructured interviews with multiple study participants to compare the data's consistency and reduced the risk of false interpretation by implementing member checking through follow-up meetings with research participants after the initial interview. I also conducted document analysis by requesting the participants to provide printed or online materials used to attract and retain IT professionals. I provided an audit trail, which included detailed documentation of the research process and the decisions made for this study. I used a reflexive journal to keep track of my actions and decisions during the data collection process. I also used a reflexive journal to record my ideas and uncover any personal biases that impacted the research outcomes.

Data saturation is an iterative data collection and analysis process that continues until no new information or themes emerge from the data (Cook et al., 2016). Data saturation is evident when no further data collection or analysis is needed (Saunders et al., 2018). Nelson (2017) stated that the researcher must provide evidence of reaching data saturation. According to Fusch and Ness (2015), failing to achieve data saturation impacts the quality and validity of the research. To reach data saturation, I conducted semistructured interviews with one IT manager in each of five high-tech organizations until I received redundant interview responses.

Transition and Summary

Section 2 of this study contained information about the purpose of my research. Components of this section included the role of the researcher, participants, research method and design, population sampling, ethical research, data collection technique, data analysis technique, and reliability and validity. I explained why I selected qualitative multiple case studies to explore technology-focused strategies used by IT managers to attract and retain high-tech employees. I explained why purposive sampling with semistructured interviews was appropriate for this study. Section 3 includes the purpose of the study, the presentation of research findings, and the application of results to the professional practice of IT. This section also contains implications for social change, recommendations for action and further research, reflections, and a conclusion to the study.

Section 3: Application to Professional Practice and Implications for Change

In Section 1, I introduced the background of the problem, stated the problem and purpose of the study, described the nature of the study, stated the research and interview questions, provided an overview of the conceptual framework, discussed the significance of the study, and reviewed the academic and professional literature. Section 2 included details of how I conducted the research and what role I took as the researcher. I described the participants, the research method and design, the population and sampling, and data collection, organization, and analysis techniques. I also discussed the reliability and validity of the study. In Section 3, I present the research findings and discuss their applicability to the professional practice of IT. The section also includes a discussion of implications for social change, recommendations for action and further research, reflections, and a conclusion to the study.

Overview of Study

The purpose of this qualitative multiple case study was to explore technology-focused strategies that IT managers used to attract and retain IT professionals to meet the needs of a technology-driven workforce. I collected data from semistructured interviews with IT managers from five high-tech organizations. One IT manager from each institution represented one case study. I performed member checking with the five participants to ensure that their views were correctly interpreted and presented; each participant reviewed my account of their interview for accuracy. The IT managers who participated in the study were responsible for making decisions about technology usage and had experience with implementing successful strategies to attract and retain high-tech

employees. The TTF theory and PU component of TAM served as the conceptual framework for the study. I drew the conceptual framework from TTF and PU because I analyzed employee retention strategies that capitalize on the implementation of best-suited technologies to impact user performance and retention positively.

The primary data collection techniques included semistructured, recorded interviews via the videoconferencing application Zoom and document review. I followed an interview protocol that included predetermined questions and allowed for follow-up questions. I used document review as a secondary method of data collection to aid in triangulation. Although participants did not provide company-related documents to support the study, some participants directed me to online resources used by their organization to attract and retain high-tech personnel. I transcribed the interviews using the audio transcription tool in Zoom and coded and analyzed them using NVivo. I used TA to analyze the data. The themes that emerged from the data include four strategies to attract and retain employees: (a) using high-tech tools and alternative methods, (b) employing talent management techniques, (c) amplifying organizational culture, and (d) safeguarding employee well-being. The themes and subthemes that emerged from participants' responses align with the conceptual framework, TTF theory and the PU component of TAM, and articles from the professional and academic literature review. They indicate the approaches used by study participants to attract and retain highly skilled IT professionals for the high-tech workforce (see Table 2).

Table 2*Number of Participants and Document References for Each Theme*

Major theme	No. of participants	No. of references
Using high-tech tools and alternative methods	5	40
Employing talent management techniques	5	39
Amplifying organizational culture	5	36
Safeguarding employee well-being	5	15
Total		130

Presentation of the Findings

This study's central research question was, What technology-focused strategies do IT managers use to attract and retain highly skilled IT professionals in a high-tech workforce? I conducted semistructured interviews via Zoom to collect data. The participants included five IT managers from five high-tech organizations who shared the specific characteristics of (a) being employed as an IT manager in a high-tech organization, (b) having the job responsibility of making decisions about the use of technology in the organization, and (c) having experience with implementing successful strategies to attract and retain high-tech employees. I collected information from industry documents and researched resources used by participants to support their responses during data collection. I used NVivo to classify and analyze the collected data. To remove identifiers from research participants and locations, I used the pseudonym RESP

for each respondent, followed by the sequential participant response order. During data analysis, I used the conceptual framework, which consisted of Goodhue's (1995) TTF theory and Davis' (1989) PU component of the TAM. Four main themes and 10 subthemes emerged from the data collection.

The primary themes that emerged during my interviews with the five IT managers were using high-tech tools and alternative methods, employing talent management techniques, amplifying organizational culture, and safeguarding employee well-being. The themes surfaced during the analysis of responses from the interviews. I used three approaches to analyze the data to achieve data triangulation. I used NVivo to code and analyze the data from the five semistructured interviews. I implemented member checking by allowing study participants to validate the consistency of their recorded responses, and I conducted document analysis by reviewing the online resources that study participants used to attract and retain IT professionals. The study's findings highlight the IT managers' effective strategies to attract and retain highly skilled IT professionals for the high-tech workforce.

Theme 1: Using High-Tech Tools and Alternative Methods

One theme that emerged from the data analysis was using high-tech tools and alternative methods as attraction and retention strategies. The use of technology in the recruitment process has transformed the hiring approaches used by organizations to acquire new talent. In an aggressive market for highly skilled candidates, technology is a driving force in expanding the global reach of organizations. All study participants indicated that technology usage is a recruitment strategy employed by their respective

organizations. Organizations use tools to form connections and build relationships with applicants while increasing awareness of the company brand. Many organizations use social networks to create a social presence and attract candidates (Jones, 2016). RESP 1, 2, 4, and 5 discussed adopting social media platforms and other web-based resources for recruitment purposes. RESP 3 discussed using specific open-source technologies to attract high-tech professionals to increase worldwide accessibility to qualified personnel. Many organizations have embraced various new technologies to market the company's brand to attract employees and gain a competitive advantage. The responses of all participants support the first theme: using high-tech tools and alternative methods (see Table 3).

Table 3

Number of Participants and Document References for Theme 1: Using High-Tech Tools and Alternative Methods

Major theme and subtheme	No. of participants	No. of references
Using high-tech tools and alternative methods	5	130
Social media (subtheme)	5	9
Other technologies (subtheme)	5	12
Alternative methods (subtheme)	5	16
Total		37

The IT managers in the study emphasized their reliance on high-tech tools and traditional methods to attract and retain highly skilled IT professionals. The integration of social media in the attraction and recruitment process has transformed the methods used by employers and applicants to interact (Blacksmith & Poepelman, 2014). Using new tools provides global access for employers and candidates to potential hires and new career opportunities. According to Stone et al. (2015), interactive technologies should help organizations attract applicants and positively impact the motivation levels of potential hires to apply for jobs. The interactive technologies used by study participants include social networking sites, employment websites, employment search engines, employer-review websites, and e-learning platforms. The IT managers also used the traditional methods of internal hiring and employee referrals to attract IT professionals. According to Bolles (2016), employers use the conventional resume to determine a candidate's job skills, and 70% of employers use Google search engines to determine the candidate's ability to relate to others by evaluating the applicant's people skills and exploring the applicant's online social presence. To increase the potential of selecting the right IT professionals for available positions, the study participants used a variety of strategies to improve the efficiency of the employer evaluation process.

The two conceptual frameworks used to inform this study were Goodhue's (1995) TTF theory (TTF) and Davis' (1989) PU component of the TAM. The responses of the IT managers to the interview questions reflected the technology-focused and alternative strategies used by the IT managers to attract and retain highly skilled IT professionals for the high-tech workforce. Goodhue (1995) defined TTF as how technology fits the needs

of a user in completing a job. Saadé and Bahli (2005) defined PU, an independent component of TAM, as the extent to which a user believes that utilizing a specific application will increase job performance. I combined TTF theory with PU to explore employee retention strategies that capitalized on the best-suited technologies.

Subtheme 1: Social Media

One of the subthemes of using high-tech tools and alternative methods that emerged from the data analysis was using social media to attract and retain IT personnel. Social media can be a valuable tool for companies to implement to satisfy the labor force needs of the organization. According to the Society for Human Resource Management (SHRM, 2017), 84% of organizations in the United States use social media for recruitment. Most employers, 54%, expect potential candidates to have a social media presence (Society for Human Resource Management, 2015). According to Deans and Tretola (2018), from 2011 to 2016, many organizations began to adopt social media platforms because of the increased awareness of the value of social media technology to the industry. LinkedIn was the most used social media platform among participants in this research study. This finding is consistent with the literature that indicates that LinkedIn is the most widely used professional social media website with over 332 million members in over 200 countries, as of 2015 (Bohmova, 2016). Recruiters use LinkedIn to search for potential candidates and verify details provided by candidates (Koch et al., 2018). Twitter, a primary social networking site, is also used by employers to screen employees. According to Rosen et al. (2018), Twitter is the second-ranked social media website globally, and it is one of the top 12 most visited websites in the world. Research

indicates that organizations can learn about a candidate's personality and assess hireability by screening an individual's profile (Rosen et al., 2018). RESP 1, RESP 2, and RESP 4 discussed using LinkedIn in various methods.

RESP 2 and RESP 4 said they use LinkedIn to post job advertisements. When asked about the technology-focused strategies used to attract and retain IT professionals, RESP 4 discussed a bidirectional relationship between potential candidates and his organization. They source many potential candidates on LinkedIn. RESP 4 mentioned that his organization receives recommendations and internal referrals from potential candidates. RESP 4 stated that they advertise on LinkedIn and leverage advertisements and other experiential opportunities to get the organization's name out there.

Similarly, RESP 2 mentioned that his organization posts on LinkedIn, Jobvite, Glassdoor, and other websites to leverage social media networking connections. Organizations must now embrace various new technologies to market the company's brand to attract employees and gain a competitive advantage. According to Whysall et al. (2019), firms must devote time to promoting their employer brand to attract diverse, potential employees and reflect what the organization aims to become. When discussing technology-focused strategies, the participants did not differentiate between social media and employment websites to attract and retain IT professionals. RESP 1 and RESP 5 both confirmed the use of Indeed.

RESP 1 stated that to recruit top IT professionals, the organization has added to the standard approach of posting traditional ads in the newspapers and job openings on the websites by looking at third parties, like Indeed, Facebook, and Twitter. Research

studies indicate that online job seekers differ from traditional job seekers based on education, skills, and socioeconomic status (Campos et al., 2018). According to Koch et al. (2018), traditional recruitment does not provide unlimited access to the global pool of potential job applicants (Koch et al., 2018). In a recent study, Moseson et al. (2020) found that online recruitment removes barriers and allows recruiters to identify a larger candidate pool, reducing recruitment time and costs. Shifting the recruiting paradigm to utilize online resources allows for greater geographic diversity. According to Campos et al. (2018), using online resources decreases the search costs for organizations and expands the reach to a larger audience. Limiting the number of applicants for potential career opportunities can lead to the recruitment of the wrong candidate and create expenses for the organization (Koch et al., 2018). RESP 5 stated that the organization publishes positions on the company's internal website and in Indeed and similar websites.

The literature supports social media as an attraction and retention strategy. According to Jones (2016), organizations use social networks to create a social presence and attract candidates. Many organizations have transformed recruitment by using social media to recruit applicants using their social media profiles (Blacksmith & Poepelman, 2014). Social media screening can increase the chances of a potential candidate getting hired (Rosen et al., 2018). The participants can connect with potential candidates using social media.

The subtheme, use of social media as an attraction and retention strategy, aligns with the conceptual framework used to inform this study, which consisted of Goodhue's (1995) TTF theory and Davis' (1989) PU component of the TAM. IT managers used

technology-focused strategies, such as social media to attract high-tech employees.

According to Davis et al. (1989), PU may influence the use of technology. PU relates to technology-focused strategies to attract and retain high-tech professionals because high-tech software attracts high-potential job candidates. The study participants used a variety of technological advancements to form connections between employers and employees.

Subtheme 2: Other Technologies

One of the subthemes of using high-tech tools and alternative methods that emerged from the data analysis was using other technologies to attract and retain IT personnel. Organizations use tools to form connections and build relationships with applicants while increasing awareness of the company brand. According to Phillips-Wren et al. (2016), there is a growing need for cost-effective acquirement processes to hire new employees. In addition to the more popular social networking sites such as LinkedIn, Twitter, and Facebook, other technologies were often used to attract high-tech personnel.

Huang and Chuang (2021) noted that employment websites are popular tools for online recruitment. These websites are helpful for employers because this resource provides the management of job postings and candidate information. Additionally, employment websites save money for organizations and help expand the global reach for finding candidates that fit the organization's needs. RESP 1 and RESP 5 discussed the use of websites that assist in matching the skills of potential candidates with available positions needed within their organizations. RESP 1 uses AccessDubuqueJobs.com, an employment website that local employers use to post jobs, manage applications, and attract potential candidates. RESP 1 and RESP 5 use Indeed. Indeed is a worldwide

employment search engine that organizations use to recruit potential candidates. RESP 5 stated that in addition to Indeed, his organization publishes job openings on the organization's corporate website.

RESP 2 and RESP 4 use Glassdoor, an employer-review website that employers use to attract and recruit top talent. Placing job advertisements is why RESP 2 and RESP 4 use Glassdoor. Employers and job candidates alike utilize Glassdoor. According to Marinescu et al. (2021), online reviews publicize employers' reputations. Potential candidates can learn more about hiring organizations, and employers can promote their business and interact with potential candidates. Research studies indicate that 83% of job candidates read online employer reviews and decide to pursue opportunities based on the organization's reputation (Marinescu et al., 2021). The employer's reputation can impact the ability to attract personnel. RESP 2 uses Jobvite to post positions. Jobvite is a cloud-based recruiting software provider that integrates with various apps, including LinkedIn, Facebook, Twitter, and Indeed.

In addition to LinkedIn, RESP 4 uses the following technologies to attract high-tech personnel: Fishbowl, Best Places to Work, Skills Testing, HackerRank, and Interview Science. Fishbowl, acquired by Glassdoor in September 2021, is a social media platform of verified professionals that allows individuals in the same industry to connect and collaborate (Glassdoor, 2021). According to Lunden (2021), Fishbowl, a standalone app with 1 million users, will enable customers to provide anonymous feedback about employers and search for jobs. RESP 4 explained how the organization uses Fishbowl and Best Places to Work as attraction resources:

We leverage advertisements and other sorts of experiential opportunities to get our name out there. Things like Best Places to Work and responding to messages on Fishbowl. Those things keep people aware of the value of working at this company. So that's what we leverage from an attraction standpoint.

Best Places to Work. The Glassdoor Employees' Choice Awards for the Best Places to Work is a webpage ranking the top companies based on anonymous company reviews from company employees. Employees provide their opinions about their employers, and they share whether they would recommend their employer as a workplace. According to Glassdoor, the following eight workplace attributes are rated in the review: overall company rating, career opportunities, compensation and benefits, culture and values, senior management, work-life – balance, recommend to a friend, and six-month business outlook. Glassdoor's Economic Research Team uses its proprietary awards algorithm to ensure data integrity in the rating process (Glassdoor, 2021).

HackerRank. According to Maguire et al. (2017), HackerRank is an online system organizations use to recruit programmers and test their programming skills. HackerRank provides a subscription service that assists companies in sourcing, screening, and hiring high-tech personnel (Maguire et al., 2017). HackerRank allows subscribers to solve problems in a variety of Computer Science domains. The system sponsors hackathon competitions, and participants can earn money and connect with hiring organizations. Additionally, participants can learn new programming techniques and access programming tutorials. RESP 2 and RESP 4 referenced skills testing as a strategy to attract high-tech employees. According to RESP 2, his organization incorporates

prerequisite skills testing based on the level of employment or the type of position.

HackerRank is used by RESP 4 to implement code testing for potential software engineering clients or candidates. This organization uses various software tools to keep the interview process standardized and efficient.

InterviewScience. InterviewScience is an e-learning course designed to assist customers in preparing for interviews by mastering body language utilizing neuroscience research, interactivity, and gamification (interviewscience.com). Olive Learning and InterviewBuddy.com have partnered together to provide this service.

InterviewBuddy.com offers on-demand, virtual face-to-face mock, recorded interviews with industry leaders and allows participants to review the recorded video. Clients may benefit from InterviewBuddy.com because it simulates a live interview and provides the tools to help participants improve their interviewing skills. According to Stone et al. (2015), gamification may allow for increased levels of interpersonal intervention and enhance the effectiveness of e-learning and e-training. According to Dale (2014), organizations that implement gamification seek to understand and influence desired behaviors in employees. By participating with InterviewBuddy.com, industry experts gain access to potential candidates and introduce their organization to potential employees. As an attraction strategy, some organizations use gamification to engage candidates and introduce them to the organization's culture to validate company fit (Gupta et al., 2018). Gamification, which simulates a competitive, on-the-job experience, effectively attracts and retains talent (Lowman, 2016). InterviewScience is a valuable tool

for employers and applicants to assess whether the organization or position is a good fit and improve their interviewing skills.

The literature supports using other technologies as an attraction and retention strategy. According to Onley (2016), smaller, less traditional sites emerge as alternative solutions for attracting potential hires and building relationships with candidates. Study participants used employment websites, employer-review websites, employment search engines, online systems, and an e-learning course as attraction strategies. As a selection strategy, technology usage improves the efficiency of the employer evaluation process and increases employer control (Berkelaar & Buzzanell, 2014). Technology-enabled practices assist employers in choosing the best candidate for the job. The participants can connect with potential candidates using social media.

The subtheme, other technologies as an attraction and retention strategy, aligns with TTF and PU. IT managers used technology-focused strategies, such as employment websites, search engines, employer-review websites, recruiting software, apps, online courses, and other technologies to attract and retain high-tech employees. According to Davis et al. (1989), perceived usefulness may influence the use of technology. PU relates to technology-focused strategies to attract and retain high-tech professionals because high-tech software attracts high-potential job candidates. The study participants used the technologies mentioned earlier to promote their organizations, expose potential candidates to potential work environments, assess and develop the skills of potential employees, and create connections between employers and potential employees.

Subtheme 3: Alternative Methods

Alternative methods of attracting and retaining IT personnel is a subtheme that emerged from using high-tech tools and alternative methods from the data analysis. The use of technology in the recruitment process has modified the approach used by many organizations. Nonetheless, non-technical recruitment methods have proven successful in this time of reliance on technology. According to Stone (2017), university job fairs are a valuable source for potential IT candidates. Kunttu (2017) indicated that employers benefited from university-industry collaborations. Allen (2014) conducted a study to explore the implementation of corporate universities for talent management. In the research findings, none of the participants discussed university job fairs, university-industry collaborations, or corporate universities as alternative methods to attract and retain IT professionals. Three of the participating IT managers used employee referrals to attract IT professionals. According to Cairns (2015), internal candidates staffed 65% of all job openings through employee referrals. The literature supports the decision to use referrals as an attraction strategy.

It is common for organizations to hire new candidates from current employee referrals (Ekinici, 2016). In addition to saving recruitment money by using referrals, organizations have automatic access to candidates. According to Pieper et al. (2019), referral hiring is a good business decision. Referral hiring introduces potential candidates to the organization and the organizational culture based on employees' perspectives. According to Burks et al. (2015), referred applicants are more likely to maintain employment with the organization, reduce recruitment costs, have higher productivity,

and produce positive profits for firms. Burks et al. (2015) stated that referred workers yield 21% to 39% higher earnings than non-referred workers. When asked about alternative methods to attract IT professionals, RESP 2, RESP 3, and RESP 4 shared similar insights. RESP 2 shared that exploring employee referrals is an essential strategy for his organization. RESP 2 stated that who the candidate knows is not as important as who knows the candidate. RESP 2 explained that having someone to vouch for a potential candidate makes it easier to bring the candidate into the organization. RESP 2 further explained that technical aptitude and a good organizational fit are essential strategies. According to the literature, candidates' behavioral and technical competencies are equally important (Whysall et al., 2019). Therefore, the literature affirms that managers must seek more than just technical knowledge to attract IT professionals successfully.

According to RESP 3, passive referrals are essential to their organization. If the candidate is a good fit for the organization, the organization will attempt to hire the candidate, whether seeking an employment opportunity or not. Maurer (2015b) stated that though challenging to recruit, passive candidates are desirable because they appear to be the best-qualified candidates because of their success in their current jobs. RESP 3 noted:

But, if we get a candidate, whether they apply directly to us or through the referral, or if we came across the candidate at tea, a party, or bar or something, if this candidate is a good candidate, and sometimes, they may not be looking for a

job, we will go out of the way to interview that candidate and see if we can hire the person.

RESP 3 expressed that pursuing passive referrals is the best way to recruit great talent. He further explained that one of the big recruitment channels for his organization is a reference. RESP 3 believed that if the people working for his company like the company and admire the organization's culture, they will reach out to their friendship circle or their friends' circles. RESP 3 continued that when employees reach out to their friendship circle or friends' circles, they will recommend their employer to the circles for consideration, which keeps the potential candidate from going through the vendor or the external hiring process. RESP 3 stated that this method keeps recruitment open 24 by seven by 365, and it has always worked for his organization.

RESP 4 explained that his organization receives numerous internal referrals for potential candidates. He noted that the recruiting team leverages the organizations' networks within LinkedIn. According to RESP 4, the recruiting team can bring in new people who have their networks. Then, the company utilizes those networks to expand and find additional people. RESP 4 stated that the basis of this practice is that great quality candidates tend to hang out with other great quality candidates or have worked with other great quality candidates in the past, so, there is a network effect when hiring new people. RESP 4 explained that this process allows his organization to source and meet new people. He stated that it provides the opportunity to vet those potential people within the network and utilize the consultant, who may have been a candidate in the past, as vouching capability. RESP 4 indicated that if the prior consultant speaks favorably

about the organization, validation from a trusted source is more valuable than any advertisement that the organization could run or any tool that the organization could use to attract people. RESP 4 acknowledged that the recruiting team attempts to source from existing consultants and leverage their networks to expand the organizational reach. RESP 4 rationalized that employee referrals are always a good way to attract people. Once hired, the expectation is that the newly hired person will probably hang out with people who have similar characteristics to what they possess. The belief is that if the organization likes the newly hired person, there is a good chance that the organization will also appreciate the friends of the recently employed individuals.

RESP 4 expounded that this process demonstrates that utilizing the network effect and social networking apps, like LinkedIn, from a professional standpoint to try to source people, may produce successful outcomes for the organization and referred candidates. According to the literature, the head of global employer branding and recruitment at Salesforce implements the practices used by RESP 4. The individuals that Salesforce desires to hire are generally in their employees' networks (Maurer, 2015b). Salesforce has integrated technology into the referral process by utilizing an app to allow employees to submit and track referrals. The organization administers a real-time online employee referral community, which has benefitted Salesforce, with a 50% employee participation rate (Maurer, 2015b). Salesforce sends recruitment content to candidates to recruit passive candidates, and the organization hosts networking events to expose potential candidates to current employees. The networking event helps passive candidates

to learn about the organization. Recruiting passive candidates and exploring employee referrals can ease organizations' attraction efforts.

One of the study participants used hiring internal candidates as an attraction and retention strategy. According to Maurer (2021a), internal recruiting improves retention, increases employee engagement, and assists managers in quickly redeploying employees to meet rapidly changing business needs. The literature supports the decision to use internal candidates. Internal candidates have a productivity advantage over external candidates because of the firm-specific knowledge, skills, and experience that internal hires possess (DeVaro et al., 2019). Krell (2015) defined firm-specific skills as the detailed skills required to succeed in an organization instead of general skills possessed by most. Internal candidates retain organizational knowledge and perform at an acceptable level quicker than external candidates (Krell, 2015). Additionally, internal candidates are already familiar with the organization's culture and may quickly form connections with other employees.

Organizations that hire internally save recruiting costs by hiring individuals and have automatic access to candidates. According to Maurer (2015c), utilizing the internal hiring strategy can benefit organizations by increasing employee engagement and retention and reducing the non-productive timeframe associated with hiring new candidates. When asked about the recruitment strategy used for IT professionals, RESP 2 stated:

We typically try to leverage the network within our current employees right there working at work, with those in the profession. Typically, it is leveraging internal networks using social media: LinkedIn, Glassdoor, Jobvite.

The literature supports alternative, non-technical methods as an attraction and retention strategy. Utilizing referrals was emphasized in this study. Maurer (2015a) stated that referrals are the most valuable external candidates many organizations get. RESP 3 mentioned pursuing a candidate that may not be looking for a job. Passive recruiting is growing as a strategy that organizations use to recruit potential candidates (Kim, 2020). Organizations use passive recruiting to actively seek employed candidates to fill vacant positions within hiring organizations. According to Maurer (2016b), organizations seek passive candidates already working in a highly skilled area because of their qualifications. The skills, experiences, career goals, and how the individual fits within the organization and in the position must be understood when organizations recruit (Maurer, 2016b). The study participants used the strategies of employee referrals and passive recruiting to attract and retain IT professionals.

The theme, use of alternative methods as an attraction and retention strategy, aligns with TTF and PU. IT managers used alternative methods, such as employee referrals and passive recruiting to attract high-tech employees. According to Ekinici (2016), many organizations hire candidates through employee referrals. This practice has proven beneficial for organizations that use employee referrals as a screening function. According to Davis et al. (1989), perceived usefulness may influence the use of technology. PU relates to alternative methods to attract and retain high-tech professionals

because hiring managers use a variety of online platforms to pursue active and passive candidates.

Theme 2: Employing Talent Management Techniques

The second theme from the data analysis was employing talent management techniques to attract and retain IT professionals. Talent management includes all activities required to attract, select, develop, and retain employees. According to Feffer (2015), technological advancements and changes to workforce demographics triggered a transformation in the traditional methods for talent management. Job seekers expect instant information, feedback, and a personalized approach, which can be accomplished by utilizing tools such as social media, job-searching apps, and online communities for recruiters to share organizational details and connect with candidates. Talent management practices include attraction, recruitment and selection, training and development, retention, and talent identification (Gallardo-Gallardo & Thunnissen, 2016). Research studies have indicated that talent management directly influences turnover intentions and increases retention rates. According to Pagan-Castaño et al. (2022), an organization's approach to talent management should include a balance between the needs of the organization and the expectations of employees. The three subthemes that emerged were: (a) incentives, (b) professional development, and (c) recruitment (see Table 4). Talent management is gaining importance as employers compete for skilled employees to meet the needs of an evolving workforce (Makarius & Srinivasan, 2017). Attraction and retention of employees, career advancement, and training are essential strategies used by study participants. The study participants indicated that talent management is a

recruitment strategy their respective organizations employ because the implementation of talent management techniques positively impacts the retention of talented employees.

Table 4

Number of Participants and Document References for Theme 2: Employing Talent Management Techniques

Major theme and subtheme	Source	Reference
Employing talent management techniques	5	39
Incentives (subtheme)	5	10
Professional development (subtheme)	5	17
Recruitment (subtheme)	5	8
Total		35

The IT managers stressed the importance of talent management to each respective organization. Talent management is a popular retention strategy for reducing employee turnover of talented, high-potential, or high-performing employees (Narayanan, 2016). The COVID-19 pandemic has caused a shift in talent management practices and highlighted the significance of talent management to meet the needs of employees and the organization. The pandemic has made investing in employee development and upskilling and re-skilling employees critical (Maurer, 2021a). The techniques emphasized by study participants include providing retention incentives, professional development

opportunities, and recruitment. The study participants used various talent management techniques to increase the potential of attracting and retaining IT professionals.

TTF and PU align with this central theme of employing talent management techniques to attract and retain IT professionals. The interview content reflected the talent management techniques used by the IT managers to attract and retain highly skilled IT professionals for the high-tech workforce. Goodhue (1995) defined TTF as how technology fits the needs of the jobs. The participants used online training platforms to provide technical development opportunities for employees. IT managers used talent management techniques to attract high-tech employees, such as giving retention incentives, professional development opportunities, and recruitment. According to Davis et al. (1989), perceived usefulness may influence the use of technology. PU relates to employing talent management techniques because the participants used specific technologies to attract and retain candidates.

Subtheme 1: Incentives

The first subtheme that emerged under employing talent management techniques was incentives. The COVID-19 pandemic workforce disruption has resulted in many organizations rethinking strategies to attract and retain key personnel. According to the U.S. Bureau of Labor Statistics (2021), 4 million Americans quit their jobs in July 2021. The Great Resignation, the pandemic-related mass workforce exodus, impacted various industries. According to Maurer and Mirza (2021), 40% of U.S. workers in professional and business services, including technology, are searching for new career opportunities. The voluntary workforce departures compelled organizations to raise compensation and

do more to attract talent (SHRM, 2021a). Providing meaningful incentives can help to attract and retain IT personnel.

According to Coraggio and Liu (2016), retention incentives infuse satisfaction and excitement into an organization. Incentives vary across businesses and may include tuition assistance, leadership opportunities, professional development, and rewards and recognition. Balakrishnan (2014) indicated that to retain key personnel, IT managers must provide incentives, salary, motivation, and a supportive environment. All incentives do not equate to a monetary value. Using a combination of incentives may reassure employees of how the organization values them. According to Gulati (2016), intangible benefits, such as flexibility and corporate values aligning with employees' values, can increase employee engagement. Expanded employee engagement results in decreased employee turnover. Non-monetary gifts may include healthcare benefits, recognition, rewards, and appreciation. Some employers are using benefits to attract and retain employees.

According to SHRM (2021), some organizations have introduced incentives to respond to the departure of valuable employees from the workforce. Reduced employee health care premiums, increased parental leave for childcare, expanded employee recognition programs, automatic contributions to employees' 401k plans, flexible working hours, remote working environment, and increased retirement fund matching are some efforts implemented to counteract workforce departures (Miller, 2021). The study participants discussed incentives used by their organization to attract and retain IT professionals. RESP 2 and RESP 3 discussed the importance of providing a competitive

salary to employees. RESP 2 includes stock options as an incentive. Except for RESP 3, all participants offer professional and technical development incentives. RESP 2 provides educational development incentives. RESP 2 and RESP 3 discussed how their organizations prioritize work-life balance for employees.

When discussing compensation for new employees, RESP 2 stated that to satisfy the need for new employees to look for more money, his organization always provides a salary at or above market value. RESP 2 said that addressing the pay will directly impact the organization's culture because the money and the culture will help retain employees. Similarly, RESP 3 stated that to keep great talent and not continuously lose talent to the market, his organization always pays the market or above market salary. Research conducted by SHRM indicates that 53% of U.S. workers search for new jobs because of compensation (Miller, 2021). Lower wages can negatively impact employee productivity and result in employee turnover. Employee retention largely depends on pay (Michael et al., 2016). Offering higher salaries can attract top candidates. According to Sammer (2019), the increased revenue for new hires is a growing trend because top candidates command higher wages, and the organizations need their talent. To attract and retain key IT personnel, employers must offer wage-competitive salaries.

The literature supports employing talent management techniques as an attraction and retention strategy. One technique mentioned in the interviews is providing a competitive salary, which two study participants emphasized. Monetary incentives can make employees feel satisfied, boost morale and performance, and prioritize the importance of employees to the organization (Das, 2020). One study participant indicated

that getting the pay right will improve employee retention. To retain employees, organizations must compensate valued employees at or above the industry average (Michael et al., 2016). Talent management can assist managers in retaining critical employees.

The subtheme, the use of incentives as an attraction and retention strategy, aligns with TTF and PU. IT managers used talent management techniques, such as incentives, to attract high-tech employees. According to Davis et al. (1989), perceived usefulness may influence the use of technology. PU relates to incentives because incentives are tools to attract candidates. Once the candidates are employees, they gain access to different software, various learning opportunities, and professional memberships to help employee development. The study participants used incentives to leverage software and development from a retention standpoint.

Subtheme 2: Professional Development

One subtheme of employing talent management techniques from the data analysis is professional development to attract and retain IT personnel. Training and development are critical factors that impact employee retention (Mathimaran & Kumar, 2017). Professional development of high-potential employees is imperative for organizational success. As a strategy to differentiate themselves and attract skilled talent, organizations offer training and development (Schlechter et al., 2015). The study participants provided details about how professional development is used as a talent management technique. RESP 1 requests all IT members to continue to learn. RESP 2 emphasized the importance of investing in employees' skillset by keeping them immersed in cutting-edge technology

and encouraging them to continue their education by taking advantage of the tuition reimbursement offered by the organization. RESP 4 discussed the importance of employees being lifetime learners and the learning opportunities and training resources available to employees. RESP 5 provides training through self-paced online products to help prepare for industry exams.

Professional development was not a priority for many organizations during the pandemic. The COVID-19 pandemic transformed the traditional workplace setting into a remote working environment. According to Jayathilake et al. (2021), many employees lacked training and development due to the forced global lockdown. COVID-19 caused a shift from physical classroom training to an online format. Emerging technologies have become more crucial for professional development during the COVID-19 pandemic (Mikołajczyk, 2021). RESP 5 discussed training and development opportunities guaranteed by his organization as an attraction strength of his organization. According to RESP 5, the pay discrepancy between his organization and larger companies is drastic. Therefore, Udemy, an online training platform, is used for technical development. Udemy, the largest educational online marketplace, was founded in 2010, and it has over 35 million students and more than 57,000 instructors (Mozahem, 2021). RESP 5 stated:

One of the strategies that we use is that we offer training. We purchase an online product that employees may use at their own pace, at their own time, at home. It will prepare them for industry exams, and they can take the exam. If they pass the exam, our organization will pay for the exam, and we will pay for an increase, a

step increase as well. So that's one of the main strategies that we use to attract personnel and retain them.

RESP 5 discussed the success that the training program has added to his organization and for employees. RESP 5 gave an example of one employee hired in the lowest technical position. The employee advanced through the ranks by engaging in training courses and passing industry-standard certification exams. The employee increased his salary by taking advantage of the online training courses.

RESP 1 discussed training and development opportunities provided by his organization as an attraction strategy. RESP 1 stated that because his company is smaller in size and unable to pay top dollar, his organization focuses on a professional development strategy and asks all IT members to continue to learn. RESP 1 stated that the highest technical positions within his organization are Chief Information Officer (CIO), Director of Systems, and Director of Development. He currently serves as CIO. RESP 1 noted:

We've had four employees that basically kind of rose up. They started as a Network Administrator, and then they went to a System Engineer. Then they might have gone to an Application Administrator position, but they couldn't get to that Director of IT, because there was no vacancy. So, you know the success is they worked for us for an average of five to six years. Then they parlayed that into a better position with another company, where now they're running their own IT departments. We've got five that I could name off the top of my head that really did a nice job for us. They progressed through the positions that we had available,

and then they moved on. We still stay in touch. Before COVID, we would get together once a month. Because what it's helped is we've built this network of our company's IT alumni. It's paid dividends because we can talk and bounce things off of each other. For example, we can discuss potential vendors and other experiences to discover what worked and what did not. So, it's good, because those people are getting experience outside of our company. It helps us to hear how other companies are doing it. Just having kind of that sounding board is a successful piece of it.

Gaining knowledge and skills to increase employability happens through internal and external organizational activities (Steil et al., 2020). RESP 1 uses opportunities to learn from former IT employees to benefit his organization. By maintaining the relationship between his organization and former IT employees, his organization can learn from the experiences of other organizations. RESP 3 utilizes SCRUM teams to ensure that IT members maintain their knowledge, skills, and employability. According to Morandini et al. (2021), SCRUM is an agile methodology for project management, including a team of members, with specific responsibilities. The SCRUM method includes brief 2 to 4-week periods of work on the project, called sprints, and daily planning meetings. Each sprint ends with a finished component of the final product delivered to the client. The difference between traditional project management and the SCRUM methodology is that the focus of SCRUM is to provide several iterations of a project compared to providing a one-time delivery at the end (Morandini et al., 2021). At

the end of a sprint, a Sprint Review meeting occurs to discuss accomplishments during the sprint. RESP 3 noted:

We do the SCRUM teams, almost daily meetings, knowledge sharing, and a lot of different tricks are tools that we use to keep the knowledge in-house, in the sense that if a developer is working on something, the Tech Lead should know at least 50% of what this person is doing. The manager should know at least 20% of what this guy is doing. Then, part of the trick is not that QA is doing all the testing. Management must get involved in the testing and must understand the business requirements. If something goes wrong, management should be able to solve the problem. It is not up to the developers of the operation to fix the issue. The management must participate and find a quick solution to get the business back to production.

As indicated by RESP 3, SCRUM teams facilitate knowledge sharing and increased communication. According to Tobenkin (2021), agile development rewards include improvements in performance and higher employee engagement. Cultivating an environment of higher employee engagement aligns with the goals of this study because higher engagement results in increased employee retention.

According to Naim and Lenka (2017), IT professionals are likely to leave their employers, and mentoring, as a developmental intervention, directly influences the intention to stay. RESP 2 uses a mentoring approach for employees' professional development. RESP 2 stated that onboarding new employees is a principal strategy for retention. Onboarding is orienting new employees to the organization by providing the

tools needed to become productive employees. Approximately 33% of new hires look for a new job within six months of employment, and it takes about eight months to become effective (Zielinski, 2019). Onboarding can help speed up the process of acclimation to the new organization. According to Provencher (2018), onboarding includes employees learning their new role, connecting with the organization's culture, and making a plan for continued learning. RESP 2 noted that he approaches onboarding by using a Peer Group. The Peer Group pairs the new hires with a long-term or tenured employee who can help learn the organizational nuances, such as intranets, politics, and help the new hires assimilate into the organization. In addition to onboarding, RESP 2 encourages taking advantage of tuition reimbursement. According to Lobell (2021), a growing number of organizations are providing educational benefits to employees, which creates opportunities for job promotion, career mobility, and promotes workforce development. RESP 2 noted:

My role in the organization is Director, and I help navigate employees' careers. I work closely with my HR partners, and what I realized is one of the most underutilized benefits is the actual tuition reimbursement. So, what I typically express to the teams that I manage is most companies give you a credit of \$5,000 a year. Leveraging that to the best of your ability sometimes is not necessarily regarding a technical degree. I've had people go through mini-MBA programs, where it's kind of a quick dash into what business looks like from all different aspects of the MBA program. To encourage them to broaden their perspective. So, most IT personnel are great engineers, or great administrators, from a

technical perspective. They typically come in with a very narrowed focus. So, in trying to expand their focus, I always tell them I'd rather you be better leaving me than when you came to me. If you leave me in a better position, I've done my job. The goal isn't to keep people here. In this new environment, that doesn't happen. So, if you can keep them there for five years to make them productive and then help them grow and elevate themselves to a new and higher position, I've done my job. So, I look at churn as being, if I can keep them there for more than five years, I've been successful. If they leave as a good employee and not a disgruntled one, they can always become re-hirable. That's something else that happens.

RESP 1 and RESP 2 both have the goal of retaining employees for at least five years.

RESP 1 and RESP 2 emphasized that their goal as IT managers is to help employees elevate themselves and move on. According to Maurer (2021b), 35% of employees quit their jobs searching for better compensation and benefits, and 25% of employees leave their jobs in search of a better work-life balance. Employers must address employees' concerns to increase employee engagement and reduce employee turnover.

According to Provencher (2018), to retain employees, employers must talk with employees about desired growth and present learning opportunities to achieve knowledge. RESP 4 noted that once hired, a retention strategy that his organization uses is to provide consultants with access to online learning opportunities through tools like Pluralsight, A Cloud Guru, and access to memberships. The goal is to provide knowledge and learning opportunities to help the new hires grow. Pluralsight is an online education

company that offers a variety of in-demand, self-paced video training courses, skills assessments, and analytics customized to the customers' current knowledge and preferred way to learn. According to Trent-Gurbuz (2020), Pluralsight targets individuals, software development, IT ops, and security teams. A Cloud Guru, a Pluralsight company, is an online training platform for cloud certification exams. A Cloud Guru provides on-demand cloud education. Investing in employees' professional development will help organizations retain their key personnel. When discussing the strategy used by his organization, RESP 4 stated:

So we're working to provide people knowledge and provide people learning opportunities to help them grow. That is part of our retention strategy, and I think that's the biggest focus that we have where we're leveraging software from a retention standpoint.

Another professional development strategy used by RESP 2 is the requirement for IT personnel to join Toastmasters. According to Yate (2017), effective communication positively impacts career development, and participation in Toastmasters International improves communication skills and helps build professional networks for participants. The Toastmasters International website states that the nonprofit educational organization teaches public speaking and leadership skills through a global network of over 15,800 clubs, 300,000 members in 149 countries worldwide. RESP 2 noted:

I typically require my staff to participate in Toastmasters for a year. Participating in Toastmasters will help them to be more comfortable in presenting to the C-suite and be more effective in delivering their messages. So, I think that's to be

one of the shortfalls. Either you have some people that are gifted with that. But then, if not, you can have somebody who's really technical but maybe an introvert. Because most times, the engineers and IT people typically are great at what they do, if they're just doing, you know, dealing with IT administration. But, if you say go to present to the C-suite, there's a level of uncomfortableness that comes with that. So, I always have required participation in Toastmasters. That's part of one of those things that is probably non-negotiable. At least 90% of employees who report to me have gone through Toastmasters for one year as part of my retention strategy.

The literature supports employing talent management techniques as an attraction and retention strategy. One technique mentioned in the interviews is providing professional development, which all study participants emphasized. Professional development strategies used by study participants include: the use of online training products, participation in internal and external organizational activities, knowledge sharing through SCRUM teams, onboarding, and participation in Toastmasters are the strategies used by study participants. Joia and Mangia (2017) stated that the absence of professional development and career advancement opportunities causes IT professionals to transition to careers in other fields and contributes to rapid turnover rates. To decrease employee turnover and increase retention, organizations must provide a clearly defined path for development.

Talent management can assist managers in retaining critical employees. The subtheme, professional development as an attraction and retention strategy, aligns with

TTF and PU. IT managers used talent management techniques, such as professional development, to attract high-tech employees. According to Davis et al. (1989), perceived usefulness may influence the use of technology. PU relates to professional development because online training products provide a clearly defined path for growth, and knowledge sharing between employees and managers occurs through digital technology. Technology can streamline the onboarding process by providing access to digital portals (Hirsch, 2017). The study participants used professional development to attract and retain IT professionals.

Subtheme 3: Recruitment

One of the subthemes of employing talent management techniques from the data analysis is recruiting and retaining IT personnel. According to Cairns (2015), developing relationships with potential candidates early in the recruitment process positively impacts the candidate's view of the organization. The use of technology in the recruitment process has changed the hiring strategies used by organizations and the search techniques used by job applicants to locate job openings. Technologies such as video recruitment, video interviewing, career websites, job boards, search engines, gamification, and social media are some tools used for e-recruitment. According to Banerjee and Gupta (2019), e-recruitment is a cost-effective solution to finding suitable candidates for available positions. Companies and candidates rely on technology to improve recruitment in a competitive market for top talent. According to Sołek-Borowska and Wilczewska (2018), e-recruitment transforms traditional recruitment into a time-and-space independent hiring process. The coupling of e-recruitment and traditional recruitment methods can increase

the probability of selecting the correct candidates for career opportunities, expedite the recruitment process, and is helpful as a strategy for expanding the global capacity of connecting job seekers and organizations.

Two study participants discussed recruiting methods used to attract new candidates. RESP 3 stated that hiring is an ongoing process in his organization. His philosophy is to hire the best candidate, whether a vacancy exists or not. RESP 3 believes constantly searching for new candidates increases his organization's chances of finding the best candidates, and a skilled candidate can always find a position. RESP 4 stated that his organization uses technology-based interviewing to identify candidates' technical skills. According to RESP 4, code testing, whiteboarding, and case studies are used during the interview. Technical interviews assist IT managers in assessing the candidates' problem-solving and critical thinking skills, which are requisites for high-tech positions.

The literature supports recruitment as an attraction and retention strategy. Recruitment techniques used by study participants include perpetual hiring and technical interviews. According to Behroozi et al. (2019), technical interviews appeal to hiring managers because questions can be derived from the organizations' question banks. Candidates are evaluated through objective scoring, resulting in a standardized process. Technical interviews allow candidates to showcase their technical skills and qualifications for the position.

According to Maurer (2021c), problem-solving tests are critical to hiring high-tech personnel, and for effective results, the test should relate to real-world scenarios. In

addition to testing the candidates' technical skills, communication skills and the ability to work in a high-pressure situation are also tested.

Talent management can assist managers in retaining critical employees. The subtheme, recruitment as an attraction and retention strategy, aligns with TTF and PU. IT managers used e-recruitment and perpetual hiring as attraction strategies. According to Davis et al. (1989), perceived usefulness may influence the use of technology. PU relates to recruitment because e-recruitment helps organizations attract a larger pool of applicants and expedites recruitment. According to Stone et al. (2015), e-recruitment positively impacts potential hires' motivation levels to apply for jobs (Stone et al., 2015). The study participants used recruitment to attract and retain IT professionals.

Theme 3: Amplifying Organizational Culture

One theme that emerged from the data analysis was amplifying organizational culture as an attraction and retention strategy. An organization's culture uniquely defines how employees engage, the attitudes, behaviors, values, and beliefs shared throughout the organization, and it sets the standard for everything the organization does (SHRM, 2021b). Organizational culture has become increasingly important to employees, and it impacts retention. Research studies indicate that corporate communication media and transformational leadership determine corporate culture (Aryani & Widodo, 2020). Organizational communication media encompasses all formal, informal, internal, and external company communication. Examples of corporate communication media include social media, e-mail, intranets, letters, memos, video conferencing, and team collaboration software. Any format used to communicate company information could be

categorized as corporate communication media. According to Dutta et al. (2021), organizational communication is strongly related to productivity. Choosing effective communication channels can positively impact productivity and employee engagement.

Transformational leaders are motivators, encouragers of collaboration, listeners to ideas, open-minded, and inspire members to work towards a shared vision. According to Standard (2020), transformational leaders admit and face their shortcomings, value team members, respect others, and model high standards. A transformational leader is transparent about vulnerabilities. The COVID-19 pandemic shifted the traditional view of a leader from one who knows it all to one who may be unsure because of the uncertainty of the pandemic (Anand, 2021a). All study participants indicated that corporate culture is a recruitment strategy their respective organizations employ. According to SHRM (2021b), leadership shapes organizational culture, and factors that contribute to the culture include hiring practices, onboarding, and reward and recognition programs. The study participants recognize the impact of organizational culture on organizational success. The responses of all participants support the theme of amplifying corporate culture (see Table 5).

Table 5

Number of Participants and Document References for Theme 3: Amplifying Organizational Culture

Major theme and subtheme	No. of participants	No. of references
Amplifying organizational culture	5	37
Culture (subtheme)	5	19
Person-environment-fit (subtheme)	5	10
Total		29

The IT managers emphasized promoting the organizational culture to attract and retain highly skilled IT professionals. Letchmiah and Thomas (2017) conducted a study that indicated the factors that influence the retention of high-potential employees include leadership and organizational culture, organizational purpose, developmental opportunities, meaningful work, and collegiality. Engaged employees who are content with the organization's leadership have a plan for career development, and whose values align with the organization's values perform better. According to Paul (2016), employee engagement is one of the top 5 global business strategies for business leaders. An engaged workforce can positively impact employee retention and performance. Employee engagement decreases turnover and improves retention rates (Lowman, 2016). RESP 1 mentioned that the focus of his organization is a strategy of culture and professional

development as an attraction and retention strategy. RESP 2 discussed integrating peer groups into the organizational culture to impact employee retention. RESP 3 addressed the impact of developing a culture of appreciation and recognition, and RESP 4 addressed the organization's culture of continuous learning as an attraction and retention strategy. RESP 5 mentioned the organizational culture of maintaining a family atmosphere.

The two conceptual frameworks used to inform this study, TTF and PU, align with this theme of amplifying the corporate culture. The interview content reflected how the study participants amplified organizational culture to attract and retain highly skilled IT professionals for the high-tech workforce. Goodhue (1995) defined TTF as how technology fits the needs of the jobs. The participants relied heavily on technology to maintain and communicate the organizational culture during the onboarding process and promote a culture of learning within each organization. Technology was crucial when the pandemic caused a shift from the traditional work environment to a remote working environment. According to Davis et al. (1989), perceived usefulness may influence the use of technology. PU relates to amplifying organizational culture because the participants relied on specific technologies to attract and retain candidates.

Subtheme 1: Culture

One subtheme of amplifying organizational culture that emerged from the data analysis was using culture to attract and retain IT personnel. During the COVID-19 pandemic, a challenge experienced by managers is maintaining corporate culture in a virtual work environment. In late 2020, approximately 40% of the U.S. workforce transitioned to remote work (Parsi, 2020). The shift from a traditional, physical office

setting to a virtual format required a heavier reliance on technology and reengineering of the organizational culture. To establish and maintain the culture, managers can provide frequent, honest communication about their commitment to company values, emphasize the importance of remaining connected, and provide recognition and appreciation for employee performance. According to Anand (2021a), the new organizational culture requires a mindset shift of leaders from command and control to coach and mentor.

The foundation of the culture of RESP1's organization is professional development and continuous learning. According to Grossman (2015), the strength of an organization's learning culture is the biggest driver of business impact. RESP 1 stated that employees who are accustomed to detail-oriented, process-oriented organizations might struggle with the culture of his company. Employees who think outside of the box, troubleshoot, and are comfortable making decisions are more well-suited for this organization. Individuals who need step-by-step instructions or struggle with learning new technologies tend to find more suitable employment outside of the organization. RESP 1 noted:

We have had employees who struggled with learning new technologies. We change technologies based on what's coming out and what's going on. Some people do not adapt well to the professional learning side. Some employees have struggled between culture and professional development. Other employees like working here. They know we're a privately held company, so we're not on Wall Street. We're not getting like a yo-yo every year, depending on our stock price. People like the comfort of knowing who they work for and that they work for a

family-owned business. That says something to some people. As a result, we have over 15 employees who have been with the company for more than four decades.

Developing a learning culture is supported in the literature. According to Grossman (2015), 10% of organizations have learning cultures that support an open mindset, reflect the organization's mission and goals, and foster an independent quest for knowledge. IT leaders must model lifelong learning and ensure employee engagement to cultivate a learning culture.

Research studies indicate that mentorships provide benefits for participants. According to Robinson (2014), mentored employees receive knowledge about organizational culture, increase career networks, gain greater corporate exposure, and gain career development opportunities. RESP 2 discussed integrating peer mentoring groups into the organizational culture to impact employee retention. According to Parsi (2021), transferring knowledge, building relationships, listening, and responding are the critical characteristics of mentorship. Mentorship increases engagement and creates an environment that promotes knowledge and skills exchange. Organizations that provide mentorship opportunities demonstrate commitment to employee development and retain the experiences and understanding gained from higher-level employees (Office of Human Resources, 2021). As an introduction to the organization's culture, RESP 2 stated that he approaches onboarding using a Peer Mentoring Group. The Peer Mentoring Group pairs the new hires with a higher-level team member who can help learn the organizational distinctions, such as intranets, politics, and help the new hires assimilate into the organization. RESP 2 noted:

I have created a Peer Group, and I am the Director. Often, a new employee doesn't feel comfortable going to a Director if they have a gap in some skillset or a request. So, what I typically do is pair them with a peer. The paired team member would be someone in that capacity and can help them navigate the nuances of the organization's inner workings, politics, websites, or intranets. We establish a shadow relationship between the new higher and a higher-level team member, who has already served in that particular role for a while, to help ease that transition.

RESP 2 stressed that his organization's culture keeps IT personnel learning cutting-edge technologies to ensure employees know that the organization invests in their skills. RESP 2 stated that once employees feel like they are not growing or are not adequately compensated, you're always in jeopardy of losing them. RESP 2 emphasized that his company will continue to nurture employees during onboarding and ensure that employee compensation is at or above market value. Because professional development is central to the organization's culture, RESP 2 stated:

We encourage employees to be lifelong learners and look for continuing education opportunities. So continue to grow from a technology. Sometimes it's more of opening our eyes to what they could be doing beyond just the technical piece. In my Directorship, I try to broaden employees' perspectives and understanding of the business in totality. I want the employees to understand the total picture, not just their piece but how the other pieces bring together the results.

According to Gurchiek (2019), employees value training above cash incentives. An enterprise that makes learning an organizational priority highlights training and development as a retention strategy and emphasizes a culture of learning. Corporate culture sets the atmosphere for the workplace and communicates the organization's core values.

According to Zielinski (2018), meaningful employee recognition is essential for retaining top employees. RESP3 discussed amplifying organizational culture by ensuring a culture of appreciation and recognition within his team. Miller (2021) and Coraggio and Liu (2016) categorized rewards and recognition as retention incentives. Similarly, Schramm (2017) stated that employee recognition positively impacts employee retention and engagement and is tied to an organization's core values. RESP 3 noted the following needs of employees in his organization: (1) employees need to be heard, (2) employees' ideas need to be respected, (3) employees want to participate in decision making, (4) employees want to participate in product design, and (5) employees want to be recognized. RESP 3 explained strategies that he uses in his organization. It is greatly appreciated when employees go beyond the typical call of duty. The employees receive recognition via a company newsletter. The newsletter, distributed throughout the organization, includes the employee's name, the problem, and how the employee resolved the issue. According to RESP 3, any time there is an extensive software release, employees who put in extra effort to deliver the product receive a pat on the back and company-wide recognition. RESP 3 noted, "You cannot keep everybody happy. But those who love the energy, want to work hard, and want to be rewarded for their hard

work, always will stick with you for a long, long time.” Acknowledging employee contributions to the success of an organization makes employees feel valued and increases employee motivation and retention.

RESP 4 addressed the organization’s culture of continuous learning as an attraction and retention strategy. According to Anand (2021b), many organizations provide personalized training for employees via online learning courses offered by vendors. The organizational goals are to provide knowledge and learning opportunities to help the new hires grow and retain existing high-tech personnel. RESP 4 uses continuous learning as an employee talent management technique, and uninterrupted learning is rooted in the organization's culture. Anand (2021b) states that employees must constantly learn new skills to remain productive, and companies must create an environment of lifelong learning. To amplify the organizational culture of lifelong learning, RESP 4 provides employees access to personalized training via Pluralsight, which offers self-paced video training courses, and A Cloud Guru, which provides on-demand cloud education courses. RESP 4 noted:

As consultants, we've got to continue to grow and continue to stay abreast of new technology and trends. Our access to training resources and knowledge contributors is paramount for our consultants to continue to provide good value to our clients. I talk to consultants about their training opportunities and the access to training resources that we provide. We get rave reviews. We make sure to hire people who are lifetime learners. That’s one of the characteristics that we look for during the interview process. Does this person want to continue learning and

growing as a technologist, even past their hire date? You don't necessarily have to expand your skillset. We're not looking for those people. The people that we try to attract are those who want to continue learning. Every now and then, we have somebody that isn't necessarily interested in growing. People slip through the cracks. I think there's a mutual understanding between that person and us that this may not be the right place for them.

According to Johnson (2018), employees who do not want to grow can hinder the progress of other employees. Employees who do not embrace continuous learning should be reassigned to a new, challenging assignment or be encouraged to leave the organization (Johnson, 2018). RESP 4 encourages the discontinuous learners to find a better fit with a different organization.

RESP 5 discussed his organization's culture of maintaining a close-knit, family environment as a retention strategy. According to Obiekwe (2018), employees who relate to their organization as a family will commit to organizational processes and assist the organization in succeeding and achieving a competitive advantage. Employees within a family environment care for each other, trust one another, look to help each other as needed, and focus on the well-being of team members and the organization. Engaged employees whose values align with the organization's culture are consistently productive, and the organization benefits from high levels of engagement. The organizational family culture (OFC) promotes community spirit and creates an atmosphere of support, interconnection, socialization, openness, and interdependence (Obiekwe, 2018). RESP 5 noted:

We're a small organization, and we are very family- and community-oriented. We know everyone's name. We try to have a family atmosphere. We make sure that we take care of each other if anything happens. Often, that's what employees are looking for when they come to a small organization like ours. That's one of the ways that we retain a lot of our workers through that community. We have to be creative, and it's really about building relationships. Our network manager started working here because he was tired of the drive to Atlanta. He didn't want to drive anymore, and he can make double what he's making a year elsewhere. He feels comfortable and has been working here over the years. It's just really building relationships.

The strategy of building strong, positive connections between team members and being actively engaged within the workplace has produced successful results for RESP 5's organization. According to Ma et al. (2018), the more organizational connections an employee has, the more likely to stay with the company. The fact that employees choose the organizational culture and work-related responsibilities over earning higher salaries aligns with the literature. According to Alonso (2019), a relationship exists between corporate culture, employee engagement, business productivity, and profits.

The literature supports employers using culture as an attraction and retention strategy. A positive organizational culture can produce high-performing employees and directly affect an organization's performance (Gorondutse & Hilman, 2019). Employees connected to the corporate culture are more engaged, which increases retention. According to Folz (2016), organizational culture is considered a determining factor of a

company's success or failure. All study participants use corporate culture as an attraction and retention strategy to acknowledge the importance of culture to the organizations. RESP 1 and RESP 4 promote a culture of professional development and continuous learning as an attraction strategy. Peer group mentoring during the onboarding process is used by RESP 2 as an attraction strategy. RESP 3 cultivates an atmosphere of rewards and recognition in his organization. RESP 5 promotes his organization's culture of a close-knit family environment as a retention strategy. The organizational culture attracts employees whose values align with the organization's culture (Schlechter et al., 2015).

The subtheme aligns with TTF and PU, amplifying organizational culture as an attraction and retention strategy. IT managers used a variety of technologies, such as social media, e-mail, intranets, letters, memos, video conferencing, and team collaboration software to cultivate organizational culture to attract and retain high-tech employees. According to Davis et al. (1989), perceived usefulness may influence the use of technology. PU relates to technology-focused strategies to promote the organizational culture because high-tech software was essential in keeping employees and employers connected during the pandemic. The study participants used a variety of technological advancements to promote corporate culture and increase employee engagement.

Subtheme 2: Person-Environment Fit

One subtheme of amplifying organizational culture that emerged from the data analysis was using person-environment fit to attract and retain IT personnel. Ma et al. (2018) noted that the better the fit, the less likely an employee would leave an organization. Organizational fit occurs when employees' values align with the

organization's culture. According to Taylor (2021a), individuals who do not fit the organization's culture may not fully engage because they oppose the corporate philosophy and how the company operates. The lack of fit impacts employee and organizational performance and retention. According to Lee and Rhee (2019), low-performing employees can negatively impact the motivation and performance of team members.

RESP 2 explained his efforts to use a Performance Improvement Plan (PIP) as a retention strategy for an employee who did want to fit into the newly formed organization. A PIP is defined as a manager's intent to develop the skills and capabilities of low-performing employees to retain them rather than terminate them (Lee & Rhee, 2019). RESP 2 stated that EMP 1 was a great employee who was a direct report to RESP 2. Another organization acquired RESP 2's company, and EMP 1 was required to take a different organizational position, assimilate to the new environment, and adopt the new organization's latest technology. Research from SHRM (2016) indicates that a corporate acquisition occurs when one entity acquires another entity's control. The 70 to 90% acquisition failure rate may be attributed to incompatible cultures and diminished trust (SHRM, 2016). RESP 2 noted:

The employee that came along with me refused to adopt the new technology of the new company. So, despite me continuing to do the same things, basically rebirthing him, taking him through a process of understanding the latest technology that we ended up having to take on, he refused to adjust. After a few months, it began to get to a point where I had to put him on a performance

improvement plan. I gave him steps to get better and a timeline. When he didn't meet those things, I met him to say, "Look. We were acquired. We have to adapt and understand and expand our knowledge to be effective". He refused. I ended up having to release him from his responsibilities. Often, once you understand that it's not going to happen, it is best to part ways.

Despite RESP 2's efforts, the employee decided that he did not want to fit in the new organization and no longer belonged in the team. Cultivating a culture of belonging is a critical element of retention (Gurchiek, 2021a). When employees do not feel connected to the organization, they are not motivated to succeed. According to Schlechter et al. (2015), organizations hire and retain employees that fit the organizational culture, and employees who leave the organization do not fit.

RESP 2 and RESP 4 had similar ideas about low-performing employees. RESP 4 explained that employees who do not want lifelong learning experiences do not fit his organization's culture. His organization does not want to attract individuals who lack the desire to learn new technologies or expand their skillset. RESP 4 noted:

The people that we try to attract are the people who want to continue to learn, and there's a positive feedback loop that happens there. We're looking for a particular type of person, and we provide that type of person what they're looking for, and they're happy about it. We offer them more, and it just continues to produce positive feedback. Most of our consultants respond well to the availability of training. We have very few that don't. Now and then, we have somebody who isn't necessarily interested in growing. When this happens, there's a mutual

understanding between that person and us that this may not be the right place for them.

An employee who has poor organizational fit or poor performance may receive the option of either resignation or termination (Bergeron, 2020). RESP 3 and RESP 4 provided scenarios of employees who would benefit from leaving their respective organizations.

The literature supports promoting person-environment fit as an attraction and retention strategy. When hiring new candidates, employers consider the personality traits of the candidates, as well as the candidates' knowledge and skills. According to van Vianen (2018), people seek environments that match their characteristics, and the person-environment fit is the agreement between individuals and their work environment. Engaged, connected employees, whose values align with the organization's culture, are more productive. Characteristics considered when assessing culture fit include a candidate's attitude, motivation, values, and alignment with the organization's culture (Hennigan & Evans, 2018). It is important to note that organizational fit is not transferrable from one organization to another because each organization has a unique environment. The culture of one organization may not align with the culture of another organization. The lack of fit impacts employee and organizational performance and retention. According to Krishnan and Wesley (2017), the person-environment fit directly relates to employee satisfaction and turnover intention. The participants can positively impact employee retention by ensuring that each employee's unique personality and skills fit with the organization's culture.

The subtheme, use of person-environment fit as an attraction and retention strategy, aligns with TTF and PU. IT managers require employees to learn new technologies as an attraction and retention strategy and maintain continuous growth and competitiveness. According to Davis et al. (1989), perceived usefulness may influence the use of technology. PU relates to technology-focused strategies to attract and retain high-tech professionals because managers rely on technology to execute performance improvement plans. Continuous knowledge attainment about cutting-edge technologies is required for the organizations to thrive and meet the demands of clients.

Theme 4: Safeguarding Employee Well-being

One theme that emerged from the data analysis was safeguarding employee well-being as an attraction and retention strategy. According to Miller (2019), some employers offer wellness programs to attract and retain employees, maintain, improve employee morale, and improve absenteeism/presenteeism. Well-being impacts an employee's performance in the workplace, and it affects the employee's personal life. Well-being includes an individual's mental, physical, and general health, as well as satisfactory work-related and non-work-related experiences (Nielsen et al., 2017). Several factors can impact employees' well-being. According to Laine and Rinne (2015), health issues and work environment, work-life balance, workload and stress, leadership, and team dynamics are among the factors that impact employee well-being. Employees connected to the workplace are more engaged, which increases retention. According to Gurchiek (2021b), the top three drivers of workplace well-being are: (1) feeling accepted, included, and valued at work, (2) being warmly welcomed and made to feel part of the team, and

(3) having a supportive manager. RESP1, RESP 2, and RESP 3 incorporate these drivers in their approaches to safeguarding employee well-being by increasing connections within the workplace.

Team building is a strategy used by RESP 1 and RESP 2 to build relationships and increase engagement among team members. Team building can positively impact team performance (Land, 2019). Several goals can be accomplished through team-building exercises. Building team connections, improving communications, collaboration, and creating an environment of trust are team-building goals. RESP 2 noted that virtual environments require that the team is connected, and he achieves connectedness through a personalized approach called “A Day in the Life” and team-building exercises. According to Greenwood and Krol (2020), managers can build a culture of connection through regularly checking in with direct reports. “A Day in the Life” occurs when RESP 2 joins a consultant on a business trip to provide support and maintain a level of connection with the employee. RESP 2 uses this intentional check-in as a strategy to reassure consultants that he is responsible for the team and will fight for his team members as the team leader. RESP 2 builds camaraderie through team building and creates a safe space of trust and protection for his team members. Team-building activities promote positive physical and mental health because employees are engaged in activities outside of the workplace that is not work-related or stress-related (Indeed Editorial Team, 2021). Teamwork increases employee engagement. According to Agovino (2019), teamwork is an essential component in the corporate environment, and it is critical to a company’s success. Employees who are not engaged in the workplace cost

U.S. companies in the range of \$438 billion to \$605 billion in annual revenue (Agovino, 2019). RESP 1 stated that COVID -19 presented challenges with making and maintaining connections. RESP 1 noted:

It's been tough, but you know you try to build connections. You know, team events or things like that to get people to know each other, a little more. You know, so they are invested in each other.

According to Land (2019), team building should be a regularly occurring activity to increase cohesion among team members. Increased communication and activities between team members will help to build team connections. Connected employees have a sense of belonging. The more organizational relationships an employee has, the more likely the employee will stay with the company (Ma et al., 2018). The team-building approach to promote employee well-being as an attraction and retention strategy used by RESP 1 and RESP 2 aligns with the literature.

According to Williams (2020), remote work was once considered an incentive for employees. COVID-19 has caused telecommuting to be crucial for business stability. Before the pandemic, 5% of Americans worked from home three to five days per week, and by April 2020, more than 37% of U.S. workers transitioned to full-time remote work (Yang et al., 2021). Technology has been integral in the transition to the virtual workplace. In addition to the critical need for technological advancements and business continuity during the pandemic, the importance of safeguarding employee well-being is a vital need. According to Gurchiek (2020), since the start of the pandemic, between 22 to 35% of U.S. workers have experienced symptoms that impact their well-being. RESP 3

uses various techniques to safeguard the well-being of employees. Ensuring that employees feel accepted, included, and valued at work is a driver of workplace well-being (Gurchiek, 2021b) that RESP 3 executes with his employees. During the interview, RESP 3 noted that employees in his organization need to be heard, their ideas to be respected, and they want to participate in decision making. According to RESP 3, the pandemic has allowed him to attract a larger talent pool. He aims to attract and retain employees by providing remote work and flexible schedules with no geographical boundaries. RESP 3 noted that he has learned that work can be done remotely, and post-pandemic, he will not force anyone to come to the office. RESP 3 stated that maintaining the human connection is essential. To keep the bonds between team members, he may institute a same-day-a-week office visit; this once-a-week occurrence will allow team members to know one another. RESP 3 noted:

We are still implementing processes to improve telecommuting rather than giving up and saying that everybody must come to the office. I do not require employees to work from home. If somebody doesn't feel good about working from home and would like to continue coming to the office, they may. It's up to the employee.

Although I would recommend employees to stay home, get things done, and have the discipline to do it, the office will be open. It is the individual's choice. We're going to reduce the footprint of the office size. It will be a walk-in office type, and nobody will have a dedicated space. I believe that's how we can find better talent anywhere. But the time zone difference and communication difference will

always be the challenge, no matter where we are. Like any other international company, we have to manage employees and our business.

RESP 3 focused on safeguarding employee well-being by offering flexible, remote hours. Promoting remote work to protect employee well-being and as an attraction and retention strategy attracts new talent and expands the global reach of the candidate pool.

The literature supports safeguarding employee well-being. Workplace stress and the lack of employee well-being are related to high organizational productivity loss (John, 2018). A lack of employee well-being can impact employee motivation and result in a decline in business performance. According to Gensing-Pophal (2020), managers should be aware of employee productivity to monitor employee well-being and health. RESP 1, RESP 2, and RESP 3 used safeguarding employee well-being as an attraction and retention strategy. Team building is a strategy used by RESP 1 and RESP 2 to build relationships and increase engagement among team members. RESP 2 used a personalized approach called “A Day in the Life” to connect to team members. RESP 3 uses the strategy of providing remote work and flexible schedules with no geographical boundaries to safeguard employee well-being.

The theme, safeguarding employee well-being as an attraction and retention strategy, aligns with TTF and PU. The pandemic presented a challenge in maintaining employee connections, and IT managers used a variety of digital technologies to preserve relationships. Managers relied heavily on communication technologies to remain connected. According to Davis et al. (1989), perceived usefulness may influence the use of technology. PU relates to safeguarding employee well-being because high-tech

software kept employees and employers connected during the pandemic. The study participants used a variety of strategies to attract and retain high-tech personnel.

Applications to Professional Practice

The purpose of this qualitative multiple case study was to explore technology-focused strategies that IT managers used to attract and retain IT professionals to meet the needs of a technology-driven workforce. The participants in this study provided the methods they used to appeal to and keep talented, high-tech IT professionals employed within their organizations. IT managers can use strategies presented in this research study to positively impact the IT workforce by establishing technology-focused strategies and alternative methods to attract and retain IT personnel. According to Lewis (2021), the high demand for technology will remain, and the attraction and retention of skilled IT professionals will be increasingly difficult. Technology usage for recruitment and employee development can be vital for attracting and retaining high-tech IT professionals and organizational health.

The use of technology in the recruitment process has diversified the hiring approaches used by organizations to secure talented candidates. Technology is a driving force in expanding the global reach of organizations, and it allows organizations to form and maintain relationships with potential candidates and build awareness about the organization. According to Thakur (2019), technologies like social media and online review sites can market an organization's brand as a recruitment strategy. All study participants indicated that reliance on high-tech tools and traditional methods of internal

hiring and employee referrals are recruitment strategies employed by their respective organizations.

The use of social media as an attraction and retention strategy can be applied to professional practice. According to Maurer (2016a), 89% of organizations use social media to post jobs, 84% use social media for recruiting, and 77% use social media to increase employer branding. Maurer (2016a) further stated that 75% of organizations use social media to contact candidates, 71% use social media to target candidates with specific skills, and most organizations use social media to recruit managers and salaried employees. Social media can be a valuable tool for companies to satisfy the organization's labor force needs and build relationships with potential candidates.

Traditional recruitment methods for attraction and retention can be applied to professional practice. According to Gensing-Pophal (2017), high-tech tools can help automate recruitment, and conventional recruitment channels may be utilized to balance technical and personal connections. Some of the IT managers who participated in this study mentioned that posting traditional ads in the papers and job openings on websites, employee referrals, and internal hiring are effective standard recruitment methods used within their organizations. According to Frye (2017), the estimated cost of hiring a new employee is more than \$250,000. Therefore, some organizations use high-tech tools and alternative resources to select the best-suited candidates.

Employing talent management techniques is an aspect of this research study that could apply to professional practice. According to Lauby (2020), a well-developed talent management strategy provides a competitive organizational advantage. The study

participants used various talent management techniques to increase the potential of attracting and retaining IT professionals. The approaches stressed by study participants included providing retention incentives, professional development opportunities, and recruitment. Researchers could apply the findings of this study to professional practice to increase employee retention and decrease employee turnover.

Amplifying organizational culture is a facet of this research study that could apply to professional practice. According to Frye (2017), in addition to ensuring that candidates possess the technical expertise required for a position, organizations must accurately reflect the company culture and values to attract the right talent. The study participants recognized the importance of organizational culture to employees and the impact on employee retention and organizational success. Strategies used by study participants to impact attraction and retention include developing a learning culture, integrating peer mentoring groups, providing professional development opportunities, meaningful employee recognition, and onboarding. Onboarding acclimates new employees into the organizational culture and improves retention by 82% and productivity by 70% (Frye, 2017). The concept of amplifying corporate culture could lead to more productive, engaged, and retained IT personnel.

Safeguarding employee well-being is an aspect of the research study that could apply to professional practice. The COVID-19 pandemic workforce disruption has resulted in many organizations rethinking strategies to attract and retain key personnel, including safeguarding the health and well-being of employees. According to Moss (2020), leaders must prioritize social connections during the disturbance to the traditional

workplace environment, which has resulted in social distancing and remote work. Based on the study participants' responses, team building, personalized approaches to maintaining human connections, ensuring employee engagement, and providing remote work and flexible schedules are strategies they used to protect the well-being of employees. The practice of fostering an environment for healthy relationships and personal connections among employees can increase employee engagement and protect employees' health.

Implications for Social Change

The development and implementation of strategies for attracting and retaining highly skilled IT professionals can positively impact social change by creating an awareness of factors that affect employee retention and contribute to the economic growth of local communities. Using high-tech tools removes geographical boundaries and expands the global reach of organizations. Removing geographical boundaries allows organizations to create satellite offices that can impact social change by reaching new demographics to fill positions. The creation of satellite offices can impact social change by improving the local economy by providing employment opportunities and decreasing unemployment in the targeted areas. Organizations can use technology to affect social change by sharing information about humanitarian efforts that the organization is involved in to benefit charities and the local community and create opportunities for employees to engage in the community. Using technology can also impact social change by fostering an environment of lifelong learning through continuous online education and professional development to create a more sustainable, skilled workforce.

Talent management techniques reduce employee turnover and increase employee retention. Talent management techniques may impact social change by stabilizing the local economy. In a stable local economy, employees experience job security and salaries commensurate with their skillset. A well-balanced economy may promote social change through increased educational and employment opportunities, increased income-earning potential, and it may contribute to decreased violence and increased community safety. The study's findings may affect social change by providing IT managers with the tools to align organizational culture and employees' beliefs. By providing wellness programs, organizations can promote a culture of well-being, including community involvement, corporate and social connectedness, and prioritizing physical and mental health. Promoting wellness can prevent health issues, boost employee performance and improve retention.

Recommendations for Action

The development and implementation of strategies for attracting and retaining IT professionals require IT managers to explore their organizational culture to determine which methods will meet the needs of their organization. I explored technology-focused strategies that IT managers used to attract and retain IT professionals to meet the needs of a technology-driven workforce. I recommend that IT managers use technology-based tools and traditional methods to form connections and build relationships as an attraction and retention strategy. By adopting resources like InterviewScience and InterviewBuddy.com, industry experts gain access to potential candidates and introduce their organization to potential employees to assess whether the organization or position is

a good fit and improve their interviewing skills. Using technology provides global access for employers and candidates to potential hires and new career opportunities. Managers can use recruitment marketing tools and social media platforms to reach potential candidates.

I recommend that IT managers utilize internal hiring and employee referrals as an attraction and retention strategy. Internal candidates possess firm-specific knowledge and skills and are acclimated to the organization's culture. Hiring internal candidates reduces the non-productive time associated with hiring external candidates. Referral hiring introduces potential candidates to the organization and the organizational culture based on the referring employees' perspectives. In addition to saving recruitment money by using referrals, organizations have automatic access to candidates.

I recommend that IT managers promote the organizational culture through corporate communication channels and strengthen employee relationships. By building strong, positive connections and providing flexibility in workspaces, whether remote, hybrid, or traditional, IT managers can increase employee engagement while meeting the organization's needs. IT managers should regularly check in with team members and consider adopting the personalized approach called "A Day in the Life." In this approach, the IT manager joins a consultant on a business trip or workday to provide support and connect with the employee. Healthy relationships and positive connections increase the likelihood of an employee remaining with an organization.

I recommend that IT managers protect employees' mental and physical health by promoting a culture of wellness and providing wellness programs that encompass the

needs of the whole employee. The organizational culture should include the importance of daily habits that enhance well-being. Employers who recognize the relationship between well-being and performance may increase employee engagement by providing personalized incentives and benefits to meet employees' needs. Implementing programs to emphasize health and well-being may reduce turnover, increase productivity, and increase retention.

I recommend that IT managers foster a high feedback environment and conduct exit interviews to gain employees' perspectives about the organizational culture, strengths, and weaknesses, and critique areas of improvement for the organization. Continuous feedback will inform managers about employee morale and whether the current practices meet employees' needs. This consistent information will provide the tools needed for managers to respond to the needs of employees. Responsiveness helps build a healthy environment of trust, communicates to employees that the managers are interested in employee concerns, and promotes positive workplace communications. Exit interviews can be tools that employers use to understand employee departures, provide opportunities for employees to express grievances, address employee concerns, and reduce employee turnover.

I recommend that IT managers remain well-informed about retention trends and innovations to ensure that the organization remains competitive. Managers may use social media and industry resources to stay abreast of industry-related trending topics. Trade publications, journals, and magazines for IT professionals will contain industry standards and new developments. Managers should network with former employers to learn about

strategies used in other organizations. Managers should stay knowledgeable about techniques that competitors use to maintain competitive advantage.

Recommendations for Further Study

The purpose of this qualitative multiple case study was to explore technology-focused strategies that IT managers used to attract and retain IT professionals to meet the needs of a technology-driven workforce. The literature supports non-technology-focused strategies such as university job fairs, corporate universities, and university-industry collaborations as valuable strategies for attracting potential IT candidates. In the research findings, none of the participants discussed university job fairs, university-industry partnerships, or corporate universities as possible methods to attract and retain IT professionals. The recommendation is for IT managers to investigate the utility of university job fairs, corporate universities, and university-industry collaborations as possible strategies for attracting IT professionals. I would recommend that the research be expanded to explore additional alternative tools used to attract and retain high-tech IT professionals. Understanding the value of using these non-technology-focused strategies may provide IT managers with additional attraction and retention strategies

In this study, I explored 5 IT managers' strategies to attract and retain IT professionals for the workforce. I assumed that the study would include diverse IT managers. All study participants were male, and the demographics comprised 40% White, 40% Black, and 20% Indian. With the absence of female study participants, I would recommend that IT managers research their organizational culture to determine the inclusivity levels and investigate strategies to increase diversity in the IT workforce.

Additionally, I recommend further research to explore the relationship between ethnicity, gender, and retention of IT professionals. Understanding the importance of workplace diversity and inclusion can positively impact retention.

The study was limited to five participants, one IT manager from five high-tech organizations in Atlanta, Georgia. Including a more significant number of high-tech organizations in the study may provide a broader perspective of strategies used throughout high-tech organizations. In addition to increasing the number of participants in the study, I recommend expanding the geographic location to other areas in the United States and abroad. Conducting the research in a different geographical location may impact study findings by producing different outcomes. Additionally, other geographical areas may implement attraction and retention strategies based on the availability of technological resources. Understanding attraction and retention strategies used globally may contribute to a body of knowledge regarding attraction and retention strategies used worldwide.

The semistructured interviews were limited to IT managers. I recommend expanding the study to include high-tech IT professionals in different roles. Including IT professionals in roles other than IT managers will benefit the IT practice by providing access to the perspectives of other IT professionals regarding the attraction and retention strategies implemented within their organizations that motivate them to remain employed with their organizations.

The study findings indicated that the COVID-19 pandemic caused a shift in the traditional roles of leaders, and the importance of corporate culture was realized.

According to study participants, corporate culture is a recruitment strategy each organization employs. Because leadership shapes corporate culture, I recommend further study on the types of training that IT managers receive to shape the organization's culture and positively impact employee retention.

Reflections

The third time is my charm during this quest to obtain a doctoral degree. The two other unproductive attempts were in Educational Leadership and Systems Science. The Educational Leadership degree would not satisfy the requirements for my faculty position, and I did not complete the requirements for the Systems Science degree due to my daughter's passing, although I completed the Ph.D. Qualifying Exam in Systems Science, I could not complete the program, and it took me several years to reclaim the focus and motivation required to pursue the doctoral degree. Once I regained clarity of thought, I restarted my doctorate journey.

I have completed two project-based graduate degrees and an additional graduate degree that did not require research completion. At the onset of this degree pursuit, I expected a challenge because I had not conducted research before. I found the research process to be straightforward. The most challenging aspects of the research process were data collection and data analysis. Data collection was problematic because some potential candidates, who the IRB had approved, were not responsive. Several potential participants appeared excited to participate in the study and did not return the required documentation for study participation. Therefore, I had to resubmit the application to the IRB each time approved candidates did not respond, and I provided alternative

candidates' contact information. The IRB application resubmission and the delayed response rate of some participants during the pandemic impacted my progress. Data analysis was initially challenging because I was unsure of the best software to use. I considered SPSS and Excel because I was proficient with these tools. I started using Dedoose because of the low monthly cost. I decided to use NVivo because I completed a training course, and I learned that NVivo was very easy for me to use.

The preconceived ideas that I brought into the study were that IT managers would be willing to truthfully share practical strategies that have helped their organizations attract and retain employees to achieve organizational goals. I also believed that potential study participants would respond quickly and that the retention strategies used by high-tech organizations would only be technology-based. The pandemic impacted my ability to make immediate connections with approved participants, and there were delays in collecting data. I was surprised to learn that some high-tech organizations were late adopters of social media and other technologies for recruitment and attraction and that traditional recruitment methods were effective for some organizations. I conducted semistructured interviews with an interview protocol to ensure consistency in question delivery and minimize bias during the data collection process. I did not knowingly introduce bias or affect study participants' responses.

Summary and Study Conclusions

The purpose of this qualitative multiple case study was to explore technology-focused strategies that IT managers used to attract and retain IT professionals to meet the needs of a technology-driven workforce. I collected data using semistructured interviews

with IT managers from five high-tech organizations. One IT manager from each institution represented one case study. I conducted semistructured interviews and reviewed industry documents to achieve data triangulation. I used member checking to ensure the accuracy of the study findings. The themes that emerged from the data analysis included: (a) using high-tech tools and alternative methods to attract and retain, (b) employing talent management techniques to attract and retain, (c) amplifying organizational culture to attract and retain, and (d) safeguarding employee well-being to attract and retain. Study participants indicated that they used effective techniques and innovative methods to attract and retain IT personnel. In conclusion, IT managers can use various technology-focused strategies and alternative methods to attract and retain highly skilled IT professionals in a high-tech workforce.

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Appendix A: Interview Protocol

Strategies for Attracting and Retaining Highly Skilled IT Professionals for the High-Tech Workforce

Eligibility Criteria

To be eligible for participation in this study, participants must

- be employed as an IT manager in a high-tech Atlanta, Georgia, organization,
- have the job responsibility of making decisions about the use of technology in the organization,
- be experienced with implementing successful strategies to attract and retain high-tech employees, and
- have no prior working relationship with me.

Interview Script

Step 1: Introduction

Good morning. My name is Mia Moore. I am conducting this interview to gather data to satisfy the Doctor of Information Technology degree requirements at Walden University. I have worked as an IT professional in both a major corporation and a small, private firm in Atlanta, Georgia. I have been an undergraduate STEM instructor in Atlanta for over 20 years. Thank you for agreeing to participate in this two-part interview. In part 1 of the interview, I will ask you about your experiences as an IT Manager. The purpose of the interview is to get your insight into strategies that your organization has used to attract and retain highly skilled IT professionals. In part 2 of the interview, I will follow up with you to confirm that I have accurately presented your

responses to the interview questions. We can schedule the follow-up interview after this interview.

Step 2: Permission to Record Interview

I request permission to record our interview to interpret your responses and not miss any details correctly. Any comments that you make will remain confidential. Your identity will remain confidential, and details that might identify any participant, such as the study's location, will not be shared.

Step 3: Informed Consent

You have been provided a Consent Form, which is a part of a process called “informed consent.” The form includes the background of the study, procedures for the study, sample questions, risks and benefits of study participation, the voluntary nature of the study, and how privacy will be maintained for study participants. Do you have any questions regarding study participation? Are you ready to begin the interview? The recording will begin.

My name is Mia Moore. I am interviewing RESP XX on mm/dd/yy. Please confirm that I have permission to record our session, that you have received, signed, and returned the Consent Form, which includes the background of the study, procedures for the study, sample questions, risks and benefits of study participation, the voluntary nature of the study, and how privacy will be maintained for study participants.

1. What is your current role in the organization, and how long have you served in this capacity?

2. Tell me about your organization's strategies to attract and keep IT professionals.
3. Please describe your experience with IT professionals who positively responded to the strategies used within your organization.
4. Please describe your experience with IT professionals who negatively responded to the strategies used within your organization.
5. Please describe your experience with IT professionals who were not affected by the strategies used within your organization.
6. Please describe the specific strategies you use to affect retention in your workplace.
7. What other information have I missed regarding strategies you have used to attract and retain highly skilled IT professionals for the high-tech workforce?

This concludes our initial interview. I want to follow up with you in a few days regarding your responses. Additionally, I would like to request printed or online materials that you have used to attract and retain IT professionals.

Appendix B: Certificate of Completion for Training on Research with Human
Participants

