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Successful Strategies for Implementing an Enterprise Resource Planning System

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This is to certify that the doctoral study by

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Abstract

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by

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MS, George Mason University, 1994

BS, City College of New York, 1988

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

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Abstract

The enterprise resource planning (ERP) implementation success rate is as low as 30%. Researchers have shown that ERP system implementation could cause both system and organization failures, affecting operations and stakeholders, alike. The technology-organization-environment conceptual framework was used to ground this qualitative single-case study. The purpose of the study was to explore strategies that a manufacturing firm in Ghana used to implement ERP systems successfully. The population of this case study comprised 5 stakeholders from a manufacturing firm in Ghana who had success in implementing an ERP system. Data were collected using face-to-face semistructured interviews and review of various corporate documents. Data analysis consisted of reviewing interview transcripts, compiling and organizing the data using an open-coding system, grouping the data into themes, and interpreting the meaning of the themes and data. Triangulation was used to strengthen the validity of the case study design. The primary themes that emerged from data analysis included critical strategies that organizational leaders can use to implement ERP systems successfully in Ghana-based manufacturing firms. Significant findings were that leaders who engage in ERP implementation should focus on managing human and technological infrastructure resources, seeking the support of top management, and designing and executing comprehensive change management plans. Implications for positive social change include the potential to increase funding for local schools, after-school youth programs, and philanthropic donations based on increased organizational profits generated from successful ERP leader implementation strategies.

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Dedication

I devote this doctoral study first to the Almighty and everlasting God, His Blessed Mother Mary, and all the Angels and Saints who gave me the grace and knowledge through this journey. This dedication goes to my family for their appreciation and support throughout this process. To my loving wife Dr. Angela S. Wiredu, my rock and strength, you have been an inspiration and blessing during this journey; thank you for encouraging me never to give up this challenging journey. To my wonderful children, Adrian A. Boafo and Alana K. Boafo thank you for your inspiration and patience through this arduous journey. Dare to dream. Remember, with Christ, all things are possible and never-ever give up on your dreams. I hope my academic experiences would encourage you in your future endeavors. To my sister-in-law Dr. Bridgid S. Wiredu, thank you for being my prayer warrior throughout this journey; your doctoral journey inspired me. To my family members far and near, and my dear friends, thank you for your words of encouragement during this journey.

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Section 1: Foundation of the Study

Even though 67% of enterprise resource planning (ERP) software implementation projects fail (Garg & Garg, 2014) and the difficulties of implementing ERP systems are prevalent, organizational leaders spend millions of dollars to implement ERP software (Kilic, Zaim, & Delen, 2014). Organizational leaders use ERP system software to integrate (a) operations, (b) production, and (c) management resources of an organization (Li, Chang, & Yen, 2017). In general, the reasons for the success or failure of implementing an information system are diverse, complex, and legally challenging for both firm executives and ERP vendors (Dwivedi et al., 2014). The benefits of ERP systems include providing organizations with easy access to reliable integrated information allowing for improved decision making (Beheshti, Blaylock, Henderson, & Lollar, 2014; Bhattacharyya & Dan, 2014). Organizational leaders integrate supply chain and customer relationship systems with their ERP to gain operational efficiencies (Arthur, 2016). Organizational leaders harness their ERP systems to develop knowledge management capabilities for their employees (Jayawickrama, Liu, & Hudson Smith, 2016). Adopting ERP implementation strategies may help business leaders improve the implementation of this complex software to ensure a successful delivery. The objective of this qualitative single-case study was to explore the strategies that some stakeholders in manufacturing use to improve ERP implementations to ensure on time and on budget project completion.

Background of the Problem

ERP software projects cost about $15 million to implement (Swanier, 2016). Organizational leaders use ERP systems to gain strategic and competitive advantages and strategically transform their business processes (Ram, Wu, & Tagg, 2014). ERP systems consist of integrated applications providing decision makers with a holistic view of information of the organization, increasing transparency and accountability, while creating an integrated and seamless supply chain between the company, suppliers, and customers (Garg & Garg, 2014).

Organizational leaders use ERP systems to improve the productivity and inventory levels of their organization. Organizational leaders implement ERP systems to reduce the cost and decision-making turnaround time as well as improve communications with value chain partners. ERP systems implementations need extensive (a) technical, (b) organizational, and (c) environmental resources to succeed (Jayawickrama et al., 2016). These valuable resources are expended mostly during the implementation stage (Ahmadi, Papageorgiou, Yeh, & Martin, 2015). Depending on the size of the organization, an ERP system implementation project may cost a few million dollars and may last up to 6 months to implement for small size firms and hundreds of millions of dollars and last several years for larger organizations (Kilic et al., 2014).

The high failure rates, risks, and uncertainties of ERP implementation are well documented in academic and practice literature. Altamony, Tarhini, Al-Salti, Gharaibeh, and Elyas (2016) reported that new ERP systems fail at the rate of 60% to 90%. According to Fadlalla and Amani (2015), at the FoxMeyer Company, ERP

implementation failure led to bankruptcy. Some business owners implement complex ERP software systems without fully understanding the critical success factors (CSFs) that drive a successful implementation of ERP systems (Garg & Garg, 2014). Knowledge of the CSFs is necessary to implement an ERP project successfully (Shatat, 2015). Based on these examples, ERP implementations consist of complex software that is difficult to implement. My objective in this study was to understand the strategies that successful firms used to implement ERP software projects.

Problem Statement

Implementing ERP systems is a capital-intensive and highly complex project and, if not implemented correctly, could lead a company to bankruptcy (Fadlalla & Amani, 2015). Garg and Garg (2014) noted that 67% of all ERP software implementation projects fail. The general business problem is that ERP software implementation failures, which result in lower supply chain efficiency, transparency, flexibility, and organizational profitability, could possibly lead to bankruptcy in the manufacturing environment. The specific business problem is that some stakeholders in manufacturing lack strategies to improve ERP implementations to ensure on time and on budget project completion.

Purpose Statement

The purpose of this qualitative single-case study was to explore the strategies that stakeholders in manufacturing used to improve ERP implementations to ensure on time and on budget project completion. The targeted population was five stakeholders in one manufacturing firm in Ghana who had been successful in using strategies to improve

ERP implementations to ensure on time and on budget project completion. The findings from this study may have a positive social effect on local communities' social change as ERP implementation strategies help stakeholders in manufacturing increase employer profitability. As a result, those manufacturing firms could have extra funds available for corporate social responsibility projects such as funding for local schools, after-school youth programs, and philanthropic donations that may improve the condition of communities.

Nature of the Study

The three research methods are qualitative, quantitative, and mixed (Yin, 2017). The qualitative research method enables a researcher to understand a phenomenon from the participants' perspectives (Yin, 2017). I used a qualitative research method because the objective of this proposed study was to achieve a comprehensive understanding of successful, ERP implementation strategies. Fellows and Liu (2015) highlighted how quantitative researchers use mathematical models, theories, or hypotheses to examine relationships among study variables. I did not use mathematical models, use hypotheses, or examine the relationships among variables because this study did not include an assessment of variables. Also, a researcher uses a quantitative method as a window to examine relationships, not a window to explore or seek out in-depth managerial issues; a quantitative methodology is inappropriate for this study. A mixed-method approach enables the exploration of a case using the qualitative method while enabling the researcher to examine the relationships among study variables; researchers use qualitative and quantitative data to reinforce the study and reduce potential weakness in the study

(Yin, 2017). A mixed-method approach was not suitable for this study because my objective in the study was to explore strategies used to implement and improve ERP software projects not examine relationships between ERP software project variables.

Qualitative research designs include case study, phenomenology, ethnography, and narrative inquiry (Yin, 2017). A case study includes the use of multiple data sources such as documentation reviews, interviews, and reflexive journals (Marshall & Rossman, 2015). I used a case study design to identify the successful strategies stakeholders in manufacturing used to improve ERP implementations to ensure on time and on budget project completion. Other qualitative designs that I considered for this study were phenomenology, ethnography, and narrative inquiry. Researchers use phenomenological designs to study how participants experience and perceive phenomena (Moustakas, 1994; Vagle, 2016). Because understanding participants' experiences and perceptions were not my intent of this study, I did not select a phenomenological design. Ethnography is the study and exploration of human cultures (Lamont & Swidler, 2014). My objective in this this study was to explore the experiences of the research participants and not their cultures. Using an ethnography design was not appropriate for this study. Narrative inquiry is the process of understanding and inquiry into the experience of ways humans experience the world through their stories (Rechel, Mladovsky, Ingleby, Mackenbach, & McKee, 2013). My intent in this study was to understand the actual strategies the research participants used, and not their stories of experiences in the world. I chose to use a single-case study design to answer the principal research question.

Research Question

What strategies do stakeholders in manufacturing use to improve ERP implementations to ensure on time and on budget project completion?

Interview Questions

The following interview questions support the central research question:

1. What were the reasons for undertaking an ERP software project?
2. What were the expected gains for implementing an ERP system?
3. What strategies have you used to successfully implement ERP software projects?
4. What barriers have you encountered in using strategies to successfully implement ERP software projects?
5. How did you address the barriers to implementing the successful strategies for – ERP software projects?
6. What additional comments can you share with me regarding ERP implementation strategies applied in your organization?

Conceptual Framework

The conceptual framework for this study is the technology-organization-environment (TOE) theory. DePietro, Wiarda, and Fleischer (1990) introduced the technology-organization-environment theory and Tornatzky and Fleischer (1990) refined the 1990 version of TOE theory. Tornatzky and Fleischer (1990) explained the analytical approach to studying ERP implementation strategies. The primary components characterizing TOE are (a) features of technology, (b) the readiness of an organization, and (c) the environmental conditions of a firm that drives the adoption of innovation

(Schniederjans & Yadav, 2013). As applied in this study, the TOE framework holds that the stakeholders' use of propositions in TOE framework will enable stakeholders in manufacturing to use their ERP software projects strategies to improve their businesses successfully.

The conceptual framework relating to this qualitative study included common themes from the literature review and TOE framework. Manufacturing firms' stakeholders need TOE theory and strategies to successfully improve their businesses. The TOE conceptual framework applies to ERP implementation strategies because ERP implementation strategies map to the context factors of technology, organization, and environment (Schniederjans & Yadav, 2013).

Operational Definitions

Customer relationship management (*CRM*): CRM is a process to build organizational capabilities to innovate and sustain customer relations (Beheshti et al., 2014).

Enterprise resource planning system: An ERP system is an integrated software package consisting of software modules designed to support all business processes in all departments within an organization (Maas, Fenema, & Soeters, 2014).

Go-Live: Go-live is the period signifying the end of software development deployment or the point at which the software is ready for use or release (Nageldinger, 2015).

Knowledge management (*KM*): Knowledge management is an information system with the capabilities to acquire, transfer, and distribute shared information throughout an organization (Migdadi & Abu Zaid, 2016).

Return on Investment (*ROI*): Return on Investment is a measure of the profit earned from an investment (Lee, 2017).

Supply chain management (*SCM*): Supply chain management is the business processes of integrating an organization with its customers and suppliers to foster a strategic partnership with the goal of achieving competitive advantage for all stakeholders (Saber, Bahraami, & Haery, 2014).

Assumptions, Limitations, and Delimitations

Assumptions, limitations, and delimitations play a significant role in the development of peer-reviewed academic and professional research. The assumptions of a research study come from the worldview of the researcher (Yin, 2017) and the limitations highlight the potential shortcomings of the study (Silverman, 2016). The delimitations of a study comprise of the scope and boundaries (Yin, 2017).

Assumptions

An assumption is information that is questionable yet could be influential (Marshall & Rossman, 2015). The basic assumptions that I made was the that the participants of the study would respond to all interview questions with integrity and honestly and share their experiences on the strategies they used to implement the ERP system successfully at their organization. All the five participants responded to my interview and follow-up questions with enthusiasm and without any hesitations. To

improve the trustworthiness of my findings, I sent participants a summary of the interview responses for feedback. Participants had 2 days to respond to my email. The participants responded to my inquiries for feedback on time. The participants did not have any changes to the summary of the interview.

Limitations

Limitations, according to Silverman (2016), represent factors such as defects and conditions that are beyond the control of the researcher. The small sample size of this study may limit the transferability of the findings to other ERP implementation strategy studies in Ghana. Another possible limitation is bias. I used bracketing to limit my personal bias. My work experience in the area of ERP implementation could have resulted in misinterpretation of results that could have adversely affect the research findings. My research biases could have resulted from my perceptions and rushed interpretation of results that would have created the potential for ambiguous or unusable research results. I also mitigated biases by employing methodological triangulation. In addition, I continued interviewing until data saturation.

Delimitations

According to Merriam (2014), delimitations describe the boundaries that the researcher sets for the study. The constraints include population and sample size (Merriam, 2014). The delimitation of this qualitative single-case study was that the sample of the study was only one manufacturing firm that had successfully implemented an ERP system. The population sample, a manufacturing firm in Ghana served as a perfect case because stakeholders of the company

had knowledge of the ERP implementation strategies that resulted in an expedited and on budget implementation.

Significance of the Study

The average cost of an ERP implementation is approximately $15 million (Swanier, 2016). Approximately 58% of ERP implementations exceed their planned budgets and 65% experience schedule delays (Huang & Handfield, 2015). The significance of this study to the practice of business includes the sharing of knowledge of successful ERP implementation strategies and practices that stakeholders have used to reduce the high failure rate as well as the cost and budget overruns of ERP implementations. The findings from this study may have a positive social effect on local communities' social change as ERP implementation strategies help stakeholders in manufacturing increase employer profitability. As a result, those manufacturing firms could have extra funds available for corporate social responsibility projects such as funding for local schools, after-school youth programs, and philanthropic donations that may improve the condition of communities.

A Review of the Professional and Academic Literature

ERP systems consist of integrated applications that facilitate the flow of information within an organization and with its external customers (Garg & Garg, 2014). The objective of this literature review was to analyze professional and academic context that addresses the research question: What strategies do some stakeholders in manufacturing use to improve ERP implementations to ensure on time and on budget project completion? To research literature about this topic, I analyzed peer-reviewed

literature from Walden University Library, particularly Business Source Complete, ABI/Inform, Emerald, Science Direct, and ProQuest Central Database.

I relied on eBooks, online trade publications, and Google Scholar. The keywords that I used for searching for articles included *ERP*, *TOE*, *ERP critical success factors*, *enterprise resource planning, supply chain management, knowledge management*, and *customer relationship management.* The literature reviewed included 177 references, of which 175 (99%) are peer-reviewed article. This study has 153 (86%) references that were published in the last 5 years. Ninety-seven peer-reviewed sources are cited in this literature review section.

Technology-Organization-Environment Conceptual Framework

The TOE model is the features of technology, the readiness of an organization, and the environmental conditions of a firm that drives the adoption of innovation (Tornatzky & Fleischer, 1990). The TOE framework is a conceptualization of the theory of diffusion of innovation (DOI). According to Rogers (2003), the DOI theory comprises of internal organizational elements, technology properties, and external organization factors, which render the theory compatible with the TOE framework. Researchers use TOE framework to ground technology adoption studies (Jia, Guo, & Barnes, 2017; Kinuthia, 2015; Ruivo, Oliveira, & Neto, 2014; Schniederjans & Yadav, 2013; Yoon & George, 2013).

A review of academic and practice literature indicates that the elements of (a) technological, (b) organizational, and (c) environmental context differ for each study. The TOE framework does not include information on what specific elements organizations

need to explore (Jia et al., 2017). The lack of specificity means the framework applies to different studies (Wang & Lo, 2016). The decision to adopt innovative technology requires studying the elements of the TOE framework (Chau & Tam, 1997).

Technology Context

The technology factor of the TOE conceptual framework includes elements such as (a) information technology (IT), infrastructure, (b) relative advantage, (c) compatibility, and (d) security. Other elements include (a) complexity, (b) efficiency, and (c) competencies (Beheshti et al., 2014; Kinuthia, 2015; Ruivo et al., 2014; Schniederjans & Yadav, 2013; Yoon & George, 2013). IT infrastructure is a TOE framework technology element. ERP adoption may require the replacement of the old IT infrastructure causing culture issues such as the breakup of the organizational hierarchy (Beheshti et al., 2014). IT infrastructure reorganization results in new business units that affect the way employees perform their work. IT infrastructure is a CSF in the adoption of an ERP system.

Relative advantage is the benefit of a new technology surpassing the current technology. Yoon and George (2013) argued that relative advantage is a TOE framework technology element and suggested that firms prefer technology innovation that adopters perceive superior. Relative advantage has no relationship to the adoption of innovative technology.

Academic and professional literatures support the notion of relative advantage (Kinuthia, 2015). Yoon and George posited that organizations that adopt ERP Cloud software have a higher relative advantage than those who implement traditional ERP

systems. Organizational leaders should ensure that the relative advantage of the innovative technology is compatible with the firm.

Another technology element is compatibility. Compatibility is how well an innovation is consistent with the earlier technology (Rogers, 2003). ERP system leaders establish compatibility between the hardware and software and help move an organization from a legacy environment to a fully integrated optimized business process environment. ERP system leaders that satisfy these criteria experienced performance gains in their organizations and organizational leaders who have ERP systems with a higher level of compatibility are more likely to use the ERP system more often (Ruivo et al., 2014).

Kinuthia (2015) argued that organizational leaders are more likely to adopt an innovation that is compatible with their business culture. Jia et al. (2017) suggested that compatibility of technology innovation directly affect the decision to adopt the technology. The results of other studies indicated that no relationship exists between compatibility and technology innovation adoption (Yoon & George, 2013). Organizational leaders who adopt social ERP systems have a higher level of technology compatibility in their organizations than those who implement traditional ERP systems (Yoon & George, 2013). Organizational leaders should consider the security of their organization's compatible technical environment.

Security is a TOE framework technology element. Technology security is the perceived lapses in data storage and data exchange systems of an enterprise system (Yoon & George, 2013). Data privacy and security lapses influence technology

innovation adoption. For example, early adopters of Cloud ERP systems viewed data transmission as organizational security vulnerability. Yoon and George (2013) mentioned no relationship exists between security concerns and the influence of technology innovation adoption. Adopters of Cloud ERP have a lower level of security concerns compared to an organization that has not adopted Cloud ERP. Innovative technologies such as Cloud ERP have a level of complexity that demands the attention of management.

Complexity is a TOE framework technology element. Ruivo et al. (2014) defined *complexity* as how fast and easy users can become knowledgeable of the ERP system. Complexity is an ERP implementation CSF (Yeh & Walter, 2016). End-users are encouraged and increase their skills by a robust and new ERP system. Ruivo et al. argued that perceived complexity would cause end-users to use the ERP system infrequently. End-users become anxious and discourage by complex ERP system.

Efficiency is a TOE framework technology element. ERP system leaders improve operational efficiency for an organization and their integrated external partners. ERP system leaders use efficiency to execute business processes with ease and leaders whose organizations have a higher level of operational efficiencies are more likely to use their ERP system (Awa & Ojiabo, 2016). To implement compatible and sophisticated IT infrastructure to ensure end-user acceptance requires IT competencies.

IT competence level is a TOE framework technology element consisting of several CSFs. Schniederjans and Yadav (2013) suggested three IT competence levels including (a) IT capability, (b) knowledge management systems, and (c) capability

maturity model (CMM) level of an organization. IT capabilities include (a) data conversion, (b) data flow management, and (c) system testing and support for technology that contributes to ERP implementation success. Knowledge management systems aspect of IT competency includes factors such as (a) compatibility with the legacy, (b) relative advantage, and (c) complexity of the ERP system. The CMM level of an organization is significant to the implementation of an ERP system. Organizations with a high level of technical expertise are more likely to adopt ERP (Awa & Ojiabo, 2016). Organizational leaders use the state of the capability maturity to determine how their business IT architecture has evolved. According to Adejare, Shahzad, and Hassan (2018) technological advances have a significant influence on the implementation of an ERP system to improve the performance of a medium size firm.

TOE: Organization Context

Organizational TOE framework elements include (a) firm size, (b) firm scope, (c) formalization, (d) centralization, and (e) organization readiness. Other features include (a) top management support, (b) project management, (c) best practices, (d) understanding user requirements, (e) software evaluation, and (f) subjective norms (Jia et al., 2017, Kinuthia, 2015; Ruivo et al., 2014; Schniederjans & Yadav, 2013; Yoon & George, 2013). The effect of the size of an organization on technology adoption has many facets. Tornatzky and Fleischer (1990) argued that large organizations might have more resources at their disposal to implement a new technology. The results of several studies indicated the definite relationship between firm size and technology adoption (Kinuthia, 2015; Tornatzky & Fleischer, 1990; Yoon & George, 2013). Small size firms with fewer

financial resources invariable could become the late adopter of new technology. According to Adejare et al., (2018) organizational structure have a significant influence on the adoption of an ERP system to improve the performance of a medium size firm.

Yoon and George (2013) suggested that the relationship between the size of an organization and the capability to adopt technology innovation is absolute. Smaller organizations tend to be agile and more susceptible to early adoption of technology. To this effect, small and medium enterprises (SMEs) tend to adopt new technology better than large organizations. Kinuthia (2015) argued that small size organizations tend to implement Cloud ERP systems more often than big business because the large size firms prefer to control their mission-critical systems. The small business requires organizational readiness context factors such as technical and financial resources to adopt innovative technology. Firm size and scope are complementary factors and a small size firm by definition has a small scope.

Another TOE framework organization element is the firm scope. Jia et al. (2017) studied the adoption of enterprise systems based on IT continuance model from the perspective of the TOE framework and noted that the scope of a firm is the internal communications and internal coordination of activities. Yoon and George (2013) concluded that with the advent of the Internet, organizations had reduced the IT cost of communication and coordination. Organizational leaders with multiple offices across the globe have a unique challenge of sharing knowledge and best practices. Yoon and George also argued that the wider the scope of an organization the more likely the organizational leaders would adopt technology innovation.

The firm scope debate is similar to that of the formal organization TOE framework element. Large organizations that have a global presence have formalized internal communications more often than smaller organizations. Kinuthia (2015) posited that organizations with lower levels of formalization, such as firms with a smaller scope, are more likely to adopt innovative technology such as Cloud ERP than organizations with higher levels of formalization. Organizations with a higher level of formalization are more significant in scope because of their complex horizontal structure including multiple branches and offices (Yoon & George, 2013). Kinuthia also noted that organizations with lower-level formalization support employees with innovative plans, while organizations with higher levels of formalization may inadvertently hinder employee innovation.

Formalized organizations have a centralized authority. Centralization is a TOE framework organization element that concentrates the authority of decision making. Tornatzky and Fleischer (1990) noted the ambiguity of this organizational element of innovation adoption and noted that centralization may not affect the business processes or structure of an organization. Kinuthia (2015) argued that organizations with lower levels of centralization be more likely to adopt innovations such as Cloud ERP. In the context of TOE organization framework, formalization and centralization are complementary and highly formalized organizations have highly centralized authority.

Organizational leaders need to understand how to implement these highly complicated ERP projects that required technical and financial resources. The ability of an organization to acquire the right technical and financial resources to engage in a

project is organizational readiness (Kinuthia, 2015; Yoon & George, 2013). The two constructs of financial and technical resources are predictors of organizational readiness. To pay for hardware, software, vendor services, and program management requires financial resources. Organizational leaders need technical resources to perform tasks such as (a) install hardware, (b) install software, (c) configure software, and (d) customize the ERP system. Organizational leaders need funds to buy new technology and technical resources to implement the new technology. Kinuthia posited that organizations that have adopted ERP Cloud technology have a higher level of organizational readiness than those who have implemented traditional ERP. Organizational leaders who have achieved a high level of readiness in their organizations are more likely to adopt technology innovation (Yoon & George, 2013). The funding for technical resources as well as hardware and software purchases come from upper management. The role of upper management is a proposition factor in the implementation of an enterprise system in an organization.

Researchers' literature supports the notion that top management, including (a) organizational leaders and executives, (b) influences adoption of innovative technology, and (c) directly affects ERP adoption (Schniederjans & Yadav, 2013). A leader in an upper management position is the primary decision maker of new technology adoption and may minimize resistance to the adoption of new technology. An upper management leader controls the (a) financial, (b) technical, and (c) functional resource. Coeurderoy, Guilmot, and Vas (2014) recommended that during the introduction of new technology, senior leaders should not focus only on the system component. Senior managers must

also emphasize (a) performance measurement, (b) the effects of team leaders, and (c) their effectiveness.

Project management is an organizational element, and project managers allow an organization to (a) plan, (b) communicate, and (c) efficiently integrate with its supply chain and disseminate knowledge across the organization. According to Starinsky (2016), managers use best practices to maximize business performance by running lean operations, collaborating, and improving time-to-market. TOE framework organizational element is an example of best practices. Ruivo et al. (2014) defined *best practice* as the process of configuring and customizing the out-of-the-box functionality of ERP software package to meet business requirements. Organizational leaders use their best practice experiences to measure the level of ease of set-up, configuration, and customization to satisfy the business needs. Organizational leaders adopt best practices to enhance the process of (a) application configuration, (b) documentation, (c) testing, and (d) training. Organizational leaders who require less customization to the standard business processes embedded in the ERP software package are more likely to use the ERP system (Ruivo et al., 2014). The successful implementation of an enterprise system requires the application of best practices to business processes and system software and hardware.

The understanding of user requirements is a TOE framework organizational element. End-users significantly contribute to the success of an ERP implementation because of user knowledge and user involvement in business process re-engineering (BPR). Schniederjans and Yadav (2013) mentioned that with the strategic choice theory an end-user could determine the success or failure of a system implementation.

Organizational leaders with enhanced knowledge of user requirements are successful with ERP implementation while leaders with minimum to no knowledge of their organizational user requirements have inadequate system design and negative perceived use. Another TOE framework organizational element is system evaluation; the evaluation of an ERP system often uses the perceived cost and benefits. Adequate evaluation of ERP systems often depends on perceived financial cost and perceived benefits (Hsiung & Wang, 2014).

Organizational leaders make decisions based on their individual knowledge of their organizations' talent and financial resources. Subjective norm is a TOE framework organization element. Rahman, Jalil, Abdullah, and Robel (2014) studied Malaysian consumers' acceptance of electronic shopping and concluded that subjective norm influences the decision to use innovative technology based on perceived behavior, usefulness, and ease of use. An executive leader's decision making depends on the opinions of other team leaders and even external stakeholders (Jia et al., 2017). Organizational element influences socially integrated enterprise systems such as ERP 2.0, for example, the ability of managers to influence senior leaders' objective to renew upgrade enterprise software services.

TOE: Environmental Context

The capability of an organization to adopt new technology requires an analysis of strength, weaknesses, opportunities, and threats (SWOT) of its environment (Bull et al., 2016). The environmental factor is the third component of the TOE conceptual framework. According to Tornatzky and Fleischer (1990), the environmental factor

influences the adoption of an information system because of external factors beyond the control of the firm. The environmental elements include (a) competitive pressure, (b) trust, and (c) external pressure (Awa, & Ojiabo, 2016; Jia et al., 2017; Ruivo et al., 2014; Schniederjans & Yadav, 2013; Yoon & George, 2013).

Competition is the perceived notion that competitors are adopting innovative technology that provides competitive advantage. According to Jia et al. (2017), firms that have realized more pressure from competition are more likely to ensure they remain competitive by implementing socially enabled enterprise software such as ERP 2.0. Competition predicts the use of an ERP system. Kinuthia (2015) noted that both pressure and regulatory policies are determinants of ERP adoption. Yoon and George (2013) argued that mimetic pressure occurs when an organization imitates the actions of its competitor out of the fear of lagging behind in the industry and the higher the mimetic press, the more likely an organization will adopt socially enabled enterprise solutions. Organizational leaders could succumb to pressure from business partners who have a goal of early adoption of new technology.

An organizational leader who relies on his or her stakeholders exclusively receives unnecessary pressure from the stakeholders to adopt innovative technologies. The higher the coercive pressure from a stakeholder, the likely the organization will adopt a socially enabled enterprise solution. Organizational leaders should balance the coercive pressure with trust.

Trust is a TOE framework environmental element. Schniederjans and Yadav (2013) noted that trust is necessary for an organization to gain competitive advantage.

Past researchers on ERP implementation have failed to address the topic of trust (Schniederjans & Yadav, 2013). Trust is a CSF for ERP implementation success. For example, for system security, a TOE framework technology element, to be effective trust must exist between (a) users, (b) vendors, and (c) consultants and this example covers the trust categories of good will, contractual, and competency (Schniederjans & Yadav, 2013). Contractually, vendors are required to provide an organization with all information, including system limitations. A lack of disclosure or circumventing the implementation team to close a deal with top management leads to distrust. A vendor-firm relationship built on trust will yield the correct decision. The rendering of services of a consultant is a competency and contractual trust concern. Organizational leaders require consultants to perform their duties based on the contract. Based on the three groups of (a) vendor, (b) consultant, and (c) users, Schniederjans and Yadav hypothesized that (a) vendor process, (b) consultant process and (c) perceived usefulness positively relates to ERP implementation success.

TOE framework external pressure elements that influence the success of an organization include (a) government entities, (b) customers, and (c) vendors (Wang & Lo, 2016). Government rules and regulations often explain external pressure and could come from central and local governments, and the public at large. Wang and Lo argued that the higher the level of external pressure the more likely an organization would adopt an innovative technology. Schniederjans and Yadav (2013) hypothesized that external pressures such as regulatory pressures have a positive relationship with the success of an

ERP implementation. For example, a system implementation at an electric utility would require best practices based on government regulatory requirements.

The limitation of utilizing the TOE framework as a lens to ground the adoption of ERP system is that the relationship between the factors and the elements of the framework are loose. This inconsistency means the elements vary across industries and countries. Awa and Ojiabo (2016) posited that no single proposed adaptation model for all ERP system is available. For example, the results of a study by Ruivo et al. (2014) indicated that the technology elements of a small business in Portugal included (a) compatibility, (b) complexity, and (c) efficiency. Yoon and George (2013) identified the technology elements of (a) relative advantage, (b) compatibility, and (c) security for Cloud ERP adoption in the USA. A longitudinal study may be necessary to establish a consistent relationship between TOE framework elements, industry, and, geography. Awa and Ojiabo (2016) concluded that organizational and environmental factors do not influence ERP adoption as much as the technology factor. Garg and Garg (2014) concluded that the most elements from their study were organizational.

ERP Current Systems

The Gartner Group coined the term *enterprise resource planning* to represent software that integrates many departments within an organization (Robert Jacobs & Weston, 2007). The success of an organization directly relates to (a) information, (b) communications, and (c) technology. Information technology drives both organizational operations and decision making (Bloom, Garicano, Sadun, & Van Reenen, 2014). Information technology has evolved beyond data processing and management

information systems to strategic information systems that align with the business strategy of an organization. ERP systems have grown from material resource planning (MRP) systems to Cloud ERP systems.

ERP systems are the most popular business software for both large and small organizations (Bassiliades et al., 2017; Poba-Nzaou, Raymond, & Fabi 2014; Seethamraju, 2015; Soler, Feliks, & Ömürgönülsen, 2016). Organizations throughout the world in every sector implement ERP software. As noted by Ali and Miller (2017), North America, Asia, South America, and Europe account for 76% of the ERP market share.

The largest ERP software company is SAP AG with about 40% market share followed by Oracle and Microsoft; and Microsoft is the dominate ERP vendor in the SMEs market (Tobie, Etoundi, & Zoa, 2016). Because of advances in technologies such as software-as-a-service (SaaS), platform-as-a-service (PaaS), and infrastructure-as-a-service (IaaS) SMEs have as many opportunities as large organizations to implement ERP systems. The challenge for organizations is the strategies for successfully implementing these large multiple functionality ERP software products.

A significant ERP business process improvement is knowledge management. Organizational leaders implement knowledge management capabilities to achieve global superiority. Knowledge management is the ability of firms to harvest the various department repositories for cross-organizational education. Business leaders use their organization’s ERP software to enhance this process by allowing the free flow of information between departments. Organizational leaders need an understanding of ERP strategies to obtain optimal performance from their knowledge management.

Organizational leaders continue to purchase and implement ERP systems, and the demand for the software according to Beheshti et al., (2014) continues to increase. Although ERP systems are expensive and difficult to implement, organizations continue to implement ERP systems. One of the major modules of ERP systems is CRM. Organizational leaders use the firm's CRM to manage the internal and external relationships with customers. Organizational leaders use the firm's CRM module within ERP software to improve the business processes and customer expectations and achieve sustainable competitive advantage (Tomić & Jovanović, 2016). CRM is either a stand-alone system or part of an ERP.

Another critical ERP business process is supply chain management. Organizational leaders seek to achieve competitive advantage through defined supply chain business processes and allow leaders to connect to their suppliers, strategic partners, customers, and other third-party businesses. Organizational leaders achieved gains in product development and performance after adopting supply chain management (Hasan, Khan, & Shah, 2017). Hwang and Min (2015) noted that organizational leaders that engaged in SCM develop new products faster and achieve financial growth. A SCM enables an organizational leader the benefit of a competitive advantage in their industry.

Evidence of ERP Failures

Organizational leaders use ERP systems to improve the overall performance of their organizations including (a) budgetary, (b) economic, (c) profitability, and (d) return on investment (Egdair, Rajemi, & Nadarajan, 2015; Fadlalla & Amani, 2015). The competitive value to businesses notwithstanding, the successful implementation of ERP

systems remains a challenging engagement for most organizations. Industry experts claim that about two-thirds of all ERP system initiatives were classified as unsuccessful; some terminated before the completion, others canceled shortly after the implementation (Kilic et al., 2014; Obeidat, Masa'deh, Al-Suradi, & Tarhini, 2016). Organizational leaders need to understand the strategies for successful implementation to alleviate ERP failures.

The reasons for information system success or failure are diverse, complex and legally challenging for both firm executives and ERP vendors (Dwivedi et al., 2014). ERP implementation failures are because of (a) technical, (b) organizational, and (c) resource-related problems. The challenges could be attributed to the out-of-the-box designs. ERP systems to adhere to industry protocol, build standardized products for each industry. The out-of-the-box design coupled with the need to manage multiple stakeholders including external partners increases the level of risk of failure. This standardization requires organizations to customize products to suit their unique requirements both at the business unit and department level. Retrofitting the out-of-the-box product to meet individual needs tend to increase risk and cost of delivery (Parthasarathy & Sharma, 2016). To reduce the possibility of failure, organizational leaders must balance business process re-engineering and ERP system customization. Organizational leaders could attribute failures to budget and schedule overruns.

Kilic et al. (2014) argued that the reason for ERP implementation failure include higher than expected expense and unrealistic implementation schedules as well as the lack of product conformation to existing business practices. Kilic et al. recommended a scientifically sound selection process for the adoption and implementation of ERP

software projects. Many high-profile projects have failed. Dwivedi et al. (2014) noted that, in 1999 at Hershey Foods, the chocolate manufacturer suffered a decrease of 8 % of its stock price. The ERP failure prevented the candy company from shipping $100 million worth of Kisses and Jolly Ranchers for Halloween that year. Then, in 2000, Nike's SCM ERP implementation failed and cost the shoemaker $100 million in sales and a 20 % depression of its stock price. Hewlett-Packard's (HP) $30 million ERP implementation project cost the printer giant a financial effect of $160 million and $40 million in lost revenue.

Another notable ERP implementation failure happened in 2005. In 2005, the SAP implementation in the garbage-disposal firm Waste Management Incorporated failed. The company sued SAP executives to recover $100 million in legal fees alone (Dwivedi et al., 2014). The public sector has also had its share of ERP implementation failures. In 2004, California Marin County abandoned a $30 million investment in SAP software and related services provided by SAP and Deloitte Consulting because the delivered software was full of errors and substantially worse than the legacy system. The reasons for the failures of the high-profile cases seem diverse, complex, and legally challenging. The Hershey failure was a result of inadequate change management and end-user training. At Nike, the company attributed the failure to (a) a slow demand-planning module, (b) critical defects, (c) poor integration, and (d) the lack of proper training for their planning department staff

Whereas data-modeling problems between the legacy and SAP system was the primary reason for the failure at HP, the result was the inability of HP to process back

orders manually. Waste Management argued that they notice gaps between the software's functionality and its business requirements. Waste Management Inc. sued SAP for fraudulent sales. The Marin County government sued SAP and Deloitte Consulting for patterns of racketeering activities designed to defraud the County of more than $20 million because of the lack of promised expert resources. These examples highlight the complexity of implementing an ERP system.

ERP System Benefits

A fundamental benefit of ERP systems is a centralized database with different functional modules. Other benefits include (a) standardization of business processes, (b) eliminates duplication of data, and (c) a single view of internal, external, and global data. A centralized database that serves as a holistic information center is an advantage in the adaptation of ERP systems. Bhattacharyya and Dan (2014) suggested that ERP systems consist of reliable integrated information. Beheshti et al., (2014) reiterated this point by arguing that the universal view of information across the organization improves decision making. Ajit, Donker, and Patnaik (2014) posited that ERP systems consist of a comprehensive view of information that supports and promotes business continuity, financial statements, and corporate earnings.

ERP system users obtain benefits such as standardization and integration of business processes. Hwang and Min (2015) suggested that organizational leaders use ERP systems to integrate business applications and manage data efficiently. Maas et al. (2014) posited that the standardization and integration of business processes result in transparency and organizational controls. ERP system benefit realization occurs through

external partner integration leading to efficient communication among stakeholders. Organizational leaders seek external partner integration with SCM and CRM.

ERP systems include modules such as customer relationship management, and manufacturing production to support customers and suppliers. Hwang and Min (2015) argued that another benefit of ERP systems include the built-in industry-specific common practices that facilitate best practices. The use of standard industry practices results in improved efficiencies and reduces the potential for failure (Parthasarathy & Sharma, 2016). ERP systems have accounting benefits in the areas of (a) IT, (b) operational, (c) organizational, and (d) managerial accounting (Ajit et al., 2014). IT accounting benefit results from robust data reports. Operational accounting benefits reduce the time it takes to generate and issue monthly and yearly closures, and financial statements. According to Chang, Yen, Chang, and Jan (2014), the benefits of organizational accounting include (a) an integrated accounting application environment, (b) improved decision making, (c) internal audits, and (d) financial reporting. For managerial accounting, the benefits include (a) efficient management of capital, (b) reduction in time for generating payroll, and (c) readily availability of financial ratio analysis.

Organizational leaders gain competitive advantages from the implementation of ERP systems. ERP system advantages include enhanced efficiency in managing organizational resources and business processes in an organization. ERP system benefits include (a) performance gains from cost management, (b) increases in time-to-market, and (c) product quality driven by technology investment (Ram et al., 2014).

Organizational leaders often recognize performance gains from (a) training, (b) systems integration activities, and (c) management of knowledge.

In general, ERP systems benefits include improvements in organizational (a) expenditure, (b) production, (c) cycle time, and (d) efficiency (López & Salmeron, 2014). Another advantage of ERP systems includes internal control requirements for Sarbanes-Oxley audits (Chang et al., 2014). Ultimately, organizational leaders use their ERP systems to (a) reduce operating expenses, (b) increase sales, and (c) meet their business goals. To realize these benefits requires an understanding of the implementation strategies.

ERP Innovations and Trends

The ERP industry has several innovative technologies. These technologies include open source software such as OpenERP, cloud-based technologies known as ERP Cloud and social media platforms known as ERP social or ERP 2.0 (Gheller, Biancolino, & Patah, 2016; Grabot, Mayere, Lauroua, & Houe, 2014; Haddara & Elragal, 2015; Wang & Wang, 2014). Also, ERP systems and Internet of Things (IoT) technologies interface to support futuristic factories.

A driving factor of innovation in the ERP industry is open innovation. An open-source technology in the ERP industry means the convergence of software developers and system users using the Internet to develop, manage, and publish content collaboratively. Innovative technologies include (a) social media platforms, (b) forums, and (c) blogs. Examples of open-source ERP include OpenERP and webERP. Open innovations within the technology industry are needed for cloud computing. The benefit

of open source ERP is that the software is free. This free software is an advantage for small businesses because the product price and implementation cost of commercial ERP products are expensive. The drawback of an open source ERP includes irregular maintenance and weak support.

Despite the high cost of on-site ERP implementation, organizational leaders acquire on-site ERP systems to gain competitive advantage (Gheller et al., 2016). ERP Cloud and ERP Software-as-a-Service (SaaS) are less costly ERP Cloud is the ability of vendors to host applications over the Internet for an organization. This technology is attractive to businesses because it eliminates the need for expensive IT infrastructure and technical resources. Examples of ERP Cloud software include SAPbyDesign and Oracle NetSuite.

Software-as-a-Service innovative technology is a pay-as-you-go subscription service (Miranda, 2013). These services are becoming the go-to strategy for finance executives looking to access the latest technologies quickly and cost-effectively to support their corporate objectives. The benefits include flexibility in allocating human capital and reduction in start-up cost. Miranda (2013) suggested that in times of economic uncertainty ERP deployment via the cloud eliminates the need to use much-needed fix capital investment.

ERP cloud is relatively cheaper than traditional or on-premise ERP and includes (a) easy accessibility, (b) standard modules with few customization and (c) reduction in time-to-deployment, particularly for small businesses. Business leaders of larger organizations reap the benefits of saving on infrastructure cost. The benefits of Cloud

ERP include (a) reduces licensing cost, (b) implementation cost, and (c) total cost of ownership. ERP Cloud benefits also include (a) shorter implementation cycle, (b) reduction in the cost of IT resources, and (c) flexibility in infrastructure and software upgrades.

Challenges of ERP Cloud or SaaS include concerns about data security and personal identity information (PII) privacy (Gheller et al., 2016). Wang and Wang (2014) echoed these challenges by suggesting that cloud technology could adversely affect the (a) confidentiality, (b) data privacy, (c) data integrity, (d) compliance with government and (e) industry regulations, and (f) e-discovery. Other known challenges include the difficulties of adopting new and standardizing existing processes and implementing change management with an off-site application.

Organizational leaders have a low level of enthusiasm in adopting ERP system often because of the lack of social interaction functionality between ERP users and their partners (Grabot et al., 2014). The need to adopt ERP social includes lack of (a) communication, (b) collaboration and (c) knowledge sharing. ERP software integrated with Web 2.0 technology enables social interaction. A Web 2.0 technology is an innovative solution with interactive capabilities and tools for organizational leaders to integrate customers and suppliers into their business processes. System environments often do not have a link between their CRM and ERP systems. By utilizing Web 2.0 technologies, organizational leaders have benefited from using Facebook fan pages, blogs, and twitter handles to interact with their customers. ERP applications often do not include information about the local community. Integrating Web 2.0 technology into ERP

software introduces features such as chats and discussion threads. This technology could consist of a product perspective of the local community and lead to maximization of investment.

Integrating Web 2.0 technologies into ERP software adds to the persistent growth of organizational databases and increases the need to mine large data. Through mining corporate data, businesses seek to establish hidden relationships between their data. Big Data is a disruptive innovation that drives the value of the central database of an ERP system. Alles (2015) noted that organizational leaders employ a Big Data platform, with the capability of detailed analysis to drive (a) marketing (b) product development, (c) operational strategies, and (d) sales forecast.

ERP systems represent the core technology for the fourth industrial revolution known as Industry 4.0. The industry 4.0 framework comprises of the Internet of Things (IoT) that represents the connectivity of physical systems in cyberspace and will enable the factories of the future (Haddara & Elragal, 2015). An example of this technology is SAP's predictive maintenance module that integrates (a) ERP business data, (b) maintains personnel data, (c) spare parts, (d) production scheduling, (e) sensors, and (f) predictive algorithms, and (g) robotic machines. Haddara and Elragal recommended additional research on the intersection between ERP systems and Smart factories.

These innovative technologies positively contribute to efficiencies in business processing. The efficiencies of business processes often yield from (a) knowledge management, (b) customer relationship management, and (c) supply chain management.

These business process efficiencies require knowledge of strategies to implement ERP successfully.

ERP Implementation Strategies

The CSFs of an ERP implementation correspond to its strategies. Schniederjans and Yadav (2013) proposed a conceptual model that outlines strategies structured through the TOE conceptual framework. Many studies about ERP implementation strategies have emerged (AlQashami & Mohammad, 2015; Beheshti et al., 2014; Garg & Garg, 2014; Li et al., 2017). For an ERP implementation to be successful, an organizational leader needs to identify and manage individual critical elements. The strategies vary by (a) size of the organization, (b) type of industry, and (c) geography.

In the technology context, ERP technology strategies include (a) a well-defined technical implementation plan, (b) an acceptable technical infrastructure, (c) efficient data conversion, and (d) customization of package software (Garg &Garg; Parthasarathy & Sharma, 2016). Garg and Garg (2014) noted that technological factors positively relate to the successful implementation of ERP software projects. A well-defined technological implementation plan is a CSF of ERP software implementation (Ali & Miller, 2017; Garg & Garg, 2014). The implementation plan for the technical aspect of an ERP system often includes a phased or a “big bang” approach. The big bang approach requires migration of all the legacy business processes to the new system on go-live day, and the phased approach entails a more systematic rollout. The former has the advantage of having an entire system ready on the go-live day. The risk is legacy system may not be available for

reference. The phased approach is less risky because the legacy system is phased-out over time.

Katerattanakul, Lee, and Hong (2014) studied groups of manufacturing firms in Korean with similar business characteristics and ERP implementation approaches. Katerattanakul et al. concluded that 75% of companies used the big bang rollout approach and only 25% used the phase-in method. The size of an organization influences the decision. Small and medium sized businesses because of their less complicated business processes tend to use the big bang approach while larger firms use the phased approach. Implementation plan, as an ERP implementation strategy, maps directly to the TOE conceptual framework organizational size element.

IT infrastructure is the hardware and system software architecture that supports the needs of the business with the goal of increasing infrastructure capability and reducing IT cost (AlQashami & Mohammad, 2015). According to Garg and Garg (2014), an adequate IT infrastructure is the most important strategy for successfully implementing an ERP system. Garg and Garg argued that IT infrastructure drives performance and supports the complexities of an ERP system. Ahmadi et al. (2015) echoed this sentiment by suggesting that organizational leaders must provide adequate infrastructure support for the implementation of an ERP system.

Yeh and Walter (2016) in their study of a higher education library ERP project noted that the success of the engagement directly related to the infrastructure expertise of the university's technology team. With ERP implementations trending towards Cloud, SaaS, and IoT, the technical infrastructure of the hosting company becomes even more

critical (Gheller et al., 2016; Haddara & Elragal, 2015). Ahmad and Pinedo Cuenca (2013) argued that the success of implementing IT infrastructure does not provide the necessary changes instead the alignment of business processes with technology leads to changes in organizational culture. IT infrastructure as an ERP implementation strategy maps directly to the TOE conceptual framework technology IT infrastructure element as well as the TOE organizational change management element. This example supports the notion that an element of one could apply to multiple TOE framework context. Another technology oriented implementation strategy is customization (Garg & Garg 2014). A significant challenge for an organizational leader is determining whether to customize the software package to suit the business process or reengineer the business processes to suit the software package (Parthasarathy & Sharma, 2016).

The IT industry refers to ERP software packages as Commercial-Off-The-Shelf (COTS). In general, ERP vendors build COTS to support industry best practices with the goal of supporting as many businesses as possible. Customizations are complicated, risky, and costly and present technical challenges concerning future enhancements and upgrades (Garg & Garg 2014). The execution of an ERP upgrade may require the reversal of customizations. To alleviate such risk of customizing the ERP software, organizational leaders must customize their firm's business processes or software or a mixture of both (Parthasarathy &Sharma, 2016). To avoid choosing the incorrect option, organizational leaders tend to customize their software. Parthasarathy and Sharma conducted a case study focused on organization using two techniques: (a) the nominal group technique (NGT), and (b) the analytical hierarchy process (AHP). Parthasarathy

and Sharma argued that organizational managers could use the NGT technique to evaluate their options. Software customization is a significant strategy for ERP system implementation and aligns with the TOE organizational best practice element. To customize ERP software, managers reconfigure the package to align the software with their unique business practices (Parthasarathy &Sharma, 2016). Organizational leaders must customize with restrain.

In their study of the effect of ERP customizations on maintenance cost and support, Koch and Mitteregger (2014) concluded that the increase in customizations generates an increase in support calls and the time it takes to address each call. This need for help desk support maps customization as an ERP implementation strategy directly to the TOE technology complexity element. ERP systems consist of modular and standardized application and the cost of the system increases with customizations (Beheshti et al., 2014). The success or failure of a software package customization maps to the TOE framework IT competency element. Organizational leaders can determine the risk level of success of a customization effort by the CMM level and the IT capabilities of their organization.

Customization is the reconfiguring of an application and the aligning of existing business processes with the new ERP system. Garg and Garg (2014) recommended that retail business leaders in India balance the need for customizations and that the most important strategy is none or minimal customizations. Customizations as an ERP implementation strategy also maps directly to the TOE conceptual framework

organizational best practice element. These examples support the view that the TOE framework elements apply to different TOE context.

Another technology-oriented implementation strategy is efficient data conversation (Garg & Garg, 2014). In contemporary business environments, an ERP system is a significant tool that houses all the business data of the organization and consist of a platform for analyzing data trends for decision making (Garg & Khurana, 2017). The effect of data conversion on ERP system implementation is significant because Garg and Garg noted that inaccurate data in one module leads to data-integrity issues in the entire organization. Invalid data in an ERP system not only disrupts operations but also upsets the perception of the end-users (Li et al., 2017). End-users tend to resist the ERP system if they deem it too complicated to use. The result of inaccurate data is an ambiguous ERP system neglected by its end-users leading to degraded system performance. Data conversion as an ERP implementation strategy maps directly to the TOE conceptual framework technology complexity. Like the customization strategy, the success or failure of a data conversion effort maps to the TOE framework IT competency element. Organizational leaders could use the CMM level and the IT capabilities to determine the success or failure of a data conversion effort.

A primary tenet of the data conversion strategy is the need for organizational leaders to carefully plan the mapping of legacy data to the new ERP systems and insist that business owners confirm the accuracy of the converted data (Garg & Khurana, 2017). Data conversion as an ERP implementation strategy maps directly to the TOE conceptual framework organizational readiness element. In their data conversion study,

Garg and Khurana (2017) performed a confirmatory factor analysis (CFA) through structural equation model (SEM) to determine the risk of data conversion to an ERP implementation project. Garg and Khurana concluded that data conversion is an important strategy that requires careful execution. Data conversion strategy fits into both TOE framework technology and organizational context.

In the organization context, ERP strategies include (a) strategic planning, (b) top management support, (c) software selection, (d) consultant selection, and (e) project management. Other ERP strategies include (a) change management that comprises of business process re-engineering, training and education, and (b) user involvement (AlQashami & Mohammad, 2015; Beheshti et al., 2014; Garg & Garg, 2014; Li et al., 2017). According to Garg and Garg (2014) of the top ten ERP strategies, 80% identify as organizational. Firms implementing ERP software need to understand the strategic implementation plan to adopt and successfully implement an ERP solution. The objective of a strategic plan is to connect the vision and potential business gains of an organization (Reimer, Van Doorn, & Heyden, 2016). Strategic implementation is essential for business leaders to alleviate the potential problems of implementation. The main factors in implementing a successful strategy include (a) the role of management, (b) the alignment of business processes to the strategic plan, (c) intra-organization communications, and (d) the role of middle managers (Reimer et al., 2016). An implementation strategy could help ERP implementers to focus on internal factors instead of the usual external factors such as economic conditions and competition.

The implementation of an ERP system ensures standardized processes within an organization. The challenge is aligning the ERP system business processes with the organizational strategic plan (Mamoghli, Goepp, & Botta-Genoulaz, 2015). A practical framework to help ERP system integrators manage this alignment is a modified model-based engineering model. Using a "Model Based – ERP Alignment" method, system integrators could align ERP business processes with the organizational strategy via configurations and customizations resulting in a decrease in cost by using fewer external resources (Mamoghli et al., 2015). Strategic planning as an ERP implementation strategy maps directly to the TOE conceptual framework organizational readiness elements.

Business leaders can create the future based on a sound strategy and organizational leaders use different strategies because they envision the future differently (Hirotaka, 2013). Business leaders view and interpret their Knowledge-based view (KBV) of strategies differently. Hirotaka suggested that knowledge is the most critical factor of a strategy. Leaders must understand that a KBV of a strategy must include (a) an interpretation of the challenge in question, (b) human beings, (c) a social agenda, and (d) recognize that the strategic plan is a dynamic process. This awareness may allow business leaders to develop an effective strategic plan that aligns with business goals.

The significance of the role of top management in strategic planning is critical to the implementation of ERP systems. Hermano and Martín-Cruz (2016) suggested that strategic management research about the efficacy of top managers stems from three points of view (a) agency theory, (b) upper echelons theory, and (c) organizational behavior theory. The agency theory reflects the need to align managers and firm

objectives to increase performance and the upper echelons theory mirrors the influence of an executive's characteristics and personal traits on performance. The organizational behavior theory is how the behavior of a CEO affects the performance of a firm. According to Mullins (2013), the results of several studies showed that during ERP implementations, organizational leaders comfortably embrace ideas when directed by upper echelon.

Securing top management support is a significant ERP implementation strategy (AlQashami & Mohammad, 2015; Beheshti et al., 2014; Garg & Garg, 2014; Li et al., 2017). Once a business plan and vision are in place, the commitment of top management becomes the most influential factor. The role of senior management and their commitment to providing resources to the implementation is critical to the success of an ERP implementation **(**AlQashami & Mohammad, 2015). According to Beheshti et al. (2014), top management was the most critical ERP implementation success factor in manufacturing in the retail sector in India. Top management support as an ERP implementation strategy maps directly to the TOE conceptual framework organizational top management and organization readiness elements. Upper management usually develops and manages the strategic plan. At the center of the strategic plan is the ERP software selection and consultant selection (Garg & Garg, 2014).

ERP systems consist of integrated modules across all departments within an organization. The right ERP software is critical for agency coordination and for facilitating decision making. The selection of the right ERP software is a requirement for ERP system success. The selection process encompasses a complex matrix of business

strategies and multiple criteria that require thorough comprehension. Selecting the wrong product could lead to excessive customizations, which in turn could lead to longer implementation time and budget overruns.

Kilic et al. (2015) recommended a method for organizational leaders to navigate the complex decision-making matrix of selecting ERP software. The two-step method proposed involves (a) determining the weights of the selection criteria by utilizing the Analytic Network Process (ANP) and then (b) optimizing and ranking the weights of all the criteria with the Preference Ranking Organization Method for Enrichment Evaluations (PROMETHEE) technique. Kilic et al. argued that this hybrid method is the best way to select an ERP system.

As recommend by Kilic et al. (2014), selecting the right ERP software to reduce failure of the ERP implementation is a product of a sound and scientific method. For example, the Waste Management's ERP implementation failure was because of the selection of incompatible ERP software. Garg and Khurana (2017) cautioned that some organizational leaders purchase ERP products based on state of the art but immature technology. Selecting immature software could lead to a failed ERP implementation. Selecting the right ERP product as an ERP implementation strategy maps directly to the TOE conceptual framework organizational readiness element. After selecting the right product, the challenge is to decide on how to implement the ERP software package. Organizational leaders must decide to implement the ERP software internally or seek an external systems integrator.

Implementing an ERP system is a capital intensive and costly effort. Selecting the right system integrator or consultant is a critical strategy. The consultant could be a third-party firm or the software vendor. The goal of the selection process is to prepare technically and functionally for an implementation. The expert's (a) reputation, (b) product knowledge, and (c) financial stability determine its ERP implementation success potential and capabilities (Kilic et al., 2015).

Garg and Garg (2014) noted that the selected consultant should have a solid understanding of the business processes and its alignment with the ERP software modules. The consultant selection process is complicated, and a multi-criteria decision model is recommended to facilitate the decision-making process (Kilic et al., 2015; Khan & Faisal, 2015). Khan and Faisal suggested that firms in Qatar use the multi-criteria decision Grey-based model to (a) evaluate the selection of ERP consultants and alternatives, (b) make an informed decision, and (c) save time and money. This model could be used for both software and consultant selection processes.

The Marin County government ERP implementation failure was, in part, because of the selection of the wrong system integrator. Selecting a consultant is an ERP implementation strategy maps directly to the TOE conceptual framework organizational readiness element. Choosing a qualified consultant is a recommended strategy. In a study by Beheshti et al. (2014) the results showed that only a third of firms used consultants to help them with selecting the ERP software.

Another organizational ERP implementation strategy is an effective project management. Project management is a CSF in the implementation of ERP systems (Garg & Garg 2014;

Yeh & Walter, 2016). ERP project management includes (a) defining goals and objectives, (b) tracking progress and coordinating activities with functional and (c) technical stakeholders (AlQashami & Mohammad, 2015). According to Horning (2018), project management includes a clear project expectations document and a comprehensive project lessons learned document both of which require effective communication to disseminate. ERP systems require substantial investment capital and years to implementation to deliver these complex systems on time and within budget, an effective project plan and a knowledgeable project team are required. The complexity of ERP system implementation transcends the efforts needed for a software upgrade project (Swanier, 2016). For an ERP project plan to be developed and successfully executed, an effective project management strategy is required.

Beheshti et al. (2014) studied the strategies of an ERP implementation of manufacturing firms in Virginia, USA. The results of the study indicated that organizational leaders need a formal process to manage consultants and software vendors and a bonus scheme for the project management team. A project team member requires both functional and technical expertise especially resources with knowledge of the current business processes of the organization. Beheshti et al. recommended that project management and software vendors should collaborate on the implementation schedule and training and education activities.

Mullins (2013) studied the relationship between project management practices and successful ERP implementations in the USA. Mullins used the Project Management Effectiveness Construct (PMEC) as a foundation for the study. Mullins concluded that ~~a~~

relationship exists between project management practices and the rate of success of an ERP implementation. Project management as an ERP implementation strategy is a TOE conceptual framework organizational element. Because of the need to manage both technical and financial resources, project management is also a TOE conceptual framework organizational readiness element. Mullins (2013) noted that in the context of project management practices, a gap exist in the literature regarding usage of the project management practices and that the use of project management practices and their relationship to the rate of ERP implementation success could assist organizational managers in their endeavors to implement enterprise-wide ERP systems.

Change management strategies often lead to sustainability for an organization (Hassouna, Tarhini, Elyas, & Abou Trab, 2015). Change management strategies for ERP implementation leads to success when organizational culture and end users are managed properly (Altamony et al., 2016). A successful change management strategy is one that includes the three phrases of (a) change preparation, (b) change implementation, and (c) measure user effect (Altamony et al., 2016).

In the first phase, organizational managers seek to change organization culture and manage users. In the second phase, organization leaders strive to implement change by managing team leadership, end user communications, and training. In the final phase, organization leaders seek to measure the changes implemented by surveying end users and applying lessons learned from the previous phases. Kocaoglu and Acar (2015) noted that measuring results of the business process improvement because of change

management activities of an ERP implementation requires efficient coordination between human resources and the implementation team.

The implementation of an ERP system does not automatic trigger the reengineering of a business process. ERP is a catalyst that forces organizational leaders to evaluate their business process and adjust accordingly (Kocaoglu & Acar, 2015). The results of an improved business process because of changes associated with ERP systems may lead to (a) better means of evaluating staff performance, (b) encourage staff to be innovative, and (c) eliminate duplicate job roles by aligning ERP functions with job descriptions. The three pillars of change management strategies for ERP implementation include (a) business process re-engineering, (b) training and education, and (c) user involvement.

Re-engineering current business processes is a change management effort that is significant to the success of an ERP implementation. According to AlQashami and Mohammad (2015) organizational leaders tend to modify their existing business processes instead of customizing the new ERP system to fit their needs. The preference of organizations to redesigning their business processes instead of customization stems from the fact that such customization increases the risk of failure (Garg & Garg, 2014). Organization leaders are reluctant to modify their business processes that have served the organization well for many years (Beheshti et al., 2014). Organizations with a history of effective business processes customize the ERP system to meet the needs of the existing business processes. In this regard, business process re-engineering as an ERP

implementation strategy maps to the TOE conceptual framework technology, complexity element.

Business Process Re-engineering also leads to organizational structure changes and organizational structure change is the precursor to organization culture change. Corporate culture is the values that employees recognize as normal within their organization. Organizational leaders use their ERP systems to make changes to the business processes that lead to the need to create modified hierarchies to support the change. This necessary change allows organizational leaders to more efficiently manage the new working environment. Beheshti et al. (2014) concluded that only 50% of organizations make organizational structure changes**.** Business process re-engineering as an ERP implementation strategy is also a TOE conceptual framework organizational best practice element.

The change management factor of training and education is a strategy for ERP implementation. The performance of an ERP system is a function of employee training and education. According to Esteves (2013), organizational leaders budget about 8% for ERP education and training and the actual cost of training is about 30% of the overall implementation cost. To engage ERP consultants to train and educate, organization leaders must leverage the benefits of the system by providing training in the implementation and post-implementation stages of the project (Sykes, 2015). One of the recommended strategies is for organizational managers to foster employee networking; this can encourage employees to use and share their knowledge with their peers.

Empowering employees to own the knowledge management process will assist in alleviating resistance.

Esteves (2013) proposed a structure for managing training best practices driven by company size and location and mentioned the categories of best practices include satisfying top management and informal workplace training. Few studies have been published on informal workplace training. Further, few studies have been published regarding how organizational leaders use these best practices to enhance training and education in the workplace. Furthermore, even fewer studies exist regarding reorganizing the role of ERP training to focus on teams. Education and training as an ERP implementation strategy is a TOE conceptual framework organizational best practice element.

The training and education strategy leads to successful ERP implementation because the quality of the implementation improves. Also, the confidence of the end-users about the integrity of the new ERP system improves (Garg & Garg, 2041). Training and education strategies are the foundation for a knowledge management system. The lack of training leads to end-user resistance to the ERP system.

Guo, Wang, and Feng (2014) concluded that organizational motivation and the end-users' perceived usefulness of the ERP system conforms to the ERP assimilation theory. An organizational learning culture influences how end-users adopt to a new ERP implementation and employee knowledge of the benefits of the new system boosts their enthusiasm for the new ERP system. A prudent strategy is for organizational leader to embed end-users in the implementation process to allow them to learn the ERP system

early in the process. The training of ERP system should be consistent after implementation to sustain the eagerness of the end-users and minimize resistance.

The change management element of end-user involvement is a strategy for ERP implementation. An effective ERP implementation strategy is to inspire employees to participate in the implementation and acquire knowledge of the new ERP system (Bano & Zowghi, 2015). This inspiration maps directly to the TOE conceptual framework organizational readiness and best practice elements. Corporate leaders use their organization's ERP systems to improve efficiency in business processes of an organization. The productivity gains depend on the end-users accepting and using the new ERP system (Oldacre, 2016). Organizational managers do not realize the anticipated gains of their ERP system because of the lack of user involvement. Swanier (2016) recommended that the involvement of users should occur at the pre and post implementation stages and organizational managers should mentor employees in assimilating into the culture of a new ERP system. These recommendations also map directly to the TOE conceptual framework organizational readiness and best practice elements. Efficient communication across the organization is paramount to engaging the end-users.

In the environmental context, ERP system implementation strategies include (a) software vendor support, (b) consultant support, and (c) building trust (AlQashami & Mohammad, 201; Li et al., 2017; Schniederjans &Yadav, 2013; Yeh & Walter, 2016). Despite a plethora of academic literature on ERP strategies, Zouaghi and Laghouag (2016) noted that few researchers have studies that address the effect of vendor and consultant support. Schniederjans and Yadav (2013) pointed out that even fewer

researchers have addressed the topic of trust regarding ERP software vendors and ERP consultants.

A software vendor and consultant partnership are essential strategies required to implement ERP system. These external experts provide both functional and technical assistant, as well as training of the ERP software. The software vendor also provides in-house tools that can aid in the implementation of the ERP software including (a) business process modeling tools, (b) industry-specific business practice templates, (c) support arrangements that combine hardware and ERP software services (Li et al., 2017). These activities map directly to the TOE conceptual framework environmental external support element as well as the organizational training and best practice elements.

An effective vendor support in the pre and post implementation phases generates collaboration between (a) project team, (b) staff and (c) top management (Yeh & Walter, 2016). Such a relationship leads to an on time and on budget ERP implementation. In a Yeh and Walter (2016) multi-case study, the authors noted that the composition of the consultant support varied. In the first case study, only one consultant was engaged and served as the project champion. In the second case study, the structure included a project manager and a technical team, and the third case consisted of consultants mobilized across the enterprise. Regardless of the number of (a) vendors, (b) consultants, and (c) employee support matrix, the knowledge transfer from the consultant to the employees is non-negotiable. The strategy should include knowledge transfer from the software vendor to the employees and efficient communications between all parties.

The impetus for an innovative project is cooperation, and the underpinning of cooperation is trust (Li et al., 2017). Building trust within an organization and with its partners is a significant ERP implementation strategy. ERP innovation trends include ERP 2.0 and IoT. These trends require even higher trust. Both on premise and Cloud ERP implementations require trust of the system, vendor, and consultants to prevent system outages and security lapses.

Mayeh, Ramayah, and Mishra (2016) examined trust and the intention to use an ERP system in an Iranian organization using the Technology Acceptance Model (TAM). Mayeh et al. (2016) concluded that trust and perceived ease of use of the ERP system has a positive effect on the end users' intent to use the newly adopted ERP system. Because of the intangible nature of software implementation, employees and end-users are intrinsically resistant to using the software. Building trust with the end-users to increase the intention to use the system is important. Li et al. (2017) noted that one of the tactical activities of building trust is integrating all the project teams into the implementation process to engage end-users early in the process to increase users' intent to use the system.

Mayeh et al. (2016) addressed two types of trust. The ERP software vendor and the ERP software product trust. A software vendor's trust germinates from the users' perception of the reputation of the supplier. The trust of the ERP software product evolves from the competence of the software product to include the expected business processes and system capabilities. Mayeh et al. concluded that regardless of the type the

construct of trust is necessary. Building trust as an ERP implementation strategy is a TOE environmental element.

The Role of Knowledge Management

Providing employees with knowledge management capabilities is important for global competitive advantage. Knowledge management is the ability of firms to harness the information that they have within the organization and ERP software enhances the process by allowing the free flow of information between departments (Jayawickrama et al., 2016). The objective of knowledge management systems is to (a) develop, (b) store, (c) transfer, and (d) apply organizational knowledge (Jeng & Dunk, 2013). The developed organizational knowledge has decision making capabilities and complements the efficacy of ERP implementation. In the Jeng and Dunk study of Nike's failed ERP in 2005, the authors concluded that to achieve ERP success organizational managers must pay attention to the creation of knowledge.

Because ERP systems involve vertical integration of multiple business units, knowledge sharing across business units is critical (Maas et al., 2014). ERP systems are knowledge-intensive and require different knowledge types. Soja (2015) identified the primary type of knowledge required for a successfully implementation of ERP as (a) business knowledge, (b) technical knowledge, (c) product knowledge, (d) company-specific knowledge and (e) project knowledge. Project management requires department specific knowledge and both project managers and system integrators require company knowledge, collaboration, as well as engineering skills. Organizational managers require meta-knowledge and solution knowledge. Meta-knowledge is a combination of product

knowledge and company knowledge needed to implement enterprise systems successfully (Lech, 2014).

Knowledge management is a CSF of ERP systems because organizational leaders achieve value for their firms from improvements in business production and business process integration. Organizational leaders also use the centralized database to share information across an organization. Another ERP success factor is vendor and organizational experience. Extensive knowledge is required for organizational leaders to measure the business benefits of their ERP system. Jayawickrama et al. (2016) mentioned that efficiently managing knowledge spread across global organizations requires (a) experience system integrators, (b) vendors, and (c) end users.

An efficient management system is a function of quality information (Lin, Cole, & Dalkir, 2014). The quality of an information technology system is an important factor in the dissemination of knowledge across various departments within an organization (Somayyeh & Ghaffari, 2018). ERP systems have valuable information because of the integration of basic functions. ERP systems consist of good information aimed at increasing organizational performance by integrating (a) production, (b) finance, (c) marketing, and (d) human resources modules into a single platform (Lin et al., 2014). In this context, ERP systems consist of data that enables organizational managers to analyze the data and make decisions to comply with planning and control functions. According to Lin et al. (2014), an ERP system is the most significant decision-making tool because ERP system users have access to real-time information from different departments within an organization.

Knowledge integration into an ERP system requires investigative and communication capabilities as well as documentation skill-sets (Nwankpa, 2015). Integrating KM within an organization allows for robust business solutions and collaboration across the entire organization (Tsai & Hsu, 2014). A lack of knowledge integration results in moderated benefits compared to firms that fully implement knowledge integration (Teo & Bhattacherjee, 2014).

Organizational leaders use knowledge integration mechanisms to build momentum, reduce risk and uncertainty, and minimize knowledge discrepancies between business units within an organization. Organizational managers with knowledge competencies could achieve success in the form of (a) information quality, (b) system quality, (c) end user growth, and (d) performance (Jayawickrama et al., 2016). ERP systems are an efficient means of retrieving business information such as management reports. In general, standard-reporting features of an ERP have better meaningful information than customized reports. Jayawickrama et al. argued that the quality of the information originated from knowledge of consultants and business knowledge of users as well as the modular integration of business processes results in a centralized source of valuable information.

End users' knowledge of the ERP system improves the quality of knowledge management. End-users knowledge of the systems speeds up business processes such as (a) year-end closing, (b) efficient remittance of funds, and (c) convenient methods of paying suppliers. Knowledge of the current business processes allows users and system

integrators to configure the ERP system easily. Lack of knowledge of the current business requirements results in ERP implementation failure (Jayawickrama et al., 2016).

The use of a new ERP system results in end-users graduating from simple data entry clerks to business analyst. This confidence emboldens users and positively influences the delivery of a new ERP system. Jayawickrama et al. concluded that business process knowledge is significant to the successful implementation of an ERP system. Business process knowledge allows organizational leaders to increase profit margins, reduce cost by better understanding how to use the ERP system.

Knowledge is the primary capability required to alleviate organizational problems and increase performance (Tseng, 2016). Organizational leaders use knowledge to enhance the ability of a firm to use current knowledge and learn how to acquire new knowledge. KM capabilities include (a) technology, (b) organizational culture, and (c) the ability to acquire, transfer, distribute, and (d) apply knowledge (Tseng, 2016). Organizational leaders use these capabilities to innovate and find business opportunities. Organizational leaders also use these capabilities to efficiently manage business process changes, and better coordinate internal and external partners. The most significant influence of KM is organizational performance (Fidel, Schlesinger, & Cervera, 2015).

An organization implements knowledge management to foster innovation within the firm (Nwankpa, 2015). These innovative ideas constitute information in a centralized database within an ERP system that is shareable. The competitive advantages that organizational leaders gain from ERP systems consists of three categories (a) quality of data, (b) training and systems integration activities, and (c) management of knowledge

(Ram et al., 2014). Organizational leaders use ERP systems to gain competitive advantage such as improvements in (a) decision making, (b) inventory management, and (c) knowledge management (Ram et al., 2014). At the post-implementation phase, organizational leaders must train their staff and build knowledge bases that will facilitate the use of the ERP system

Knowledge has a competitive advantage in ERP system readiness. Ahmadi et al.(2015) studied how organizational leaders performed readiness-relevant activities to ensure successful ERP systems. The main takeaway from the study, with respect to knowledge and competitive advantage, is that an organization can increase the knowledge of its employees about the ERP system by running training programs. Ahmadi et al. argued that in this context, tangible and intangible improvements will result, and staff will be more willing to accept and work with the ERP system.

The Role of Customer Relationship Management

ERP systems are used by organizational leaders to support the (a) company, (b) supplier, (c) customers, and (d) used to improve communications between an organization and its customers. Organizational leaders use the CRM module to (a) innovate, (b) develop customer relations, and (c) sustain a competitive advantage (Beheshti et al., 2014). Businesses across the globe are becoming more customer-oriented and increasing need a CRM module to have a comprehensive view of its internal and external customers (Beheshti et al., 2014). Organizational leaders use CRM to enhance their opportunities to gain global business. In this context, Hicks (2018) suggested that consistent pricing, a TOE organizational element, is significant to CRM practices because

a constant message enhances customer fulfillment. Hicks also noted that customer satisfaction, a TOE environmental element, is a significant CRM strategy.

According to Simmons (2015), in 2012 the global CRM sales revenue was over $13 billion. The implementation failure rate was about 80%, and firms that implemented CRM systems recorded business losses of about $10.5 billion (Iriana, Buttle, & Ang, 2013). The failure rate of implementing CRM is comparable to ERP systems. The distinction between an ERP and CRM is blurred. Some CRM modules reside in an ERP package; other CRMs are standalone software products.

The CRM high failure rates notwithstanding the challenge of implementing a CRM and ERP is an issue of integration. Organizational leaders use CRM systems to smoothen the flow of data between a firm and its customers. The seamless movement of data between organizations requires system integration, which often requires a sophisticated design that could lead to technical and business challenges (Khodakarami & Chan, 2014). Organizational leaders realize the need to integrate their CRM with an ERP system. Arthur (2016) suggested that to gain efficiencies organizational leaders must integrate their SCM and CRM with their ERP. The integration will consist of a central view of supplier, customer, and organization information. The integration will also have synchronization of data within the separate databases; redundant information in the CRM and ERP databases remains an issue.

The Role of Supply Chain Management

Over the past two decades, technology advances and market globalization have changed the organizational landscape, and new political and economic conditions have emerged

(Saber et al., 2014). Globalization has increased the need to integrate suppliers and customers. Survival relates directly to the implementation of an efficient and effects information technology system. Supply chain management software is one of the enablers of information technology. Organizational leaders achieve competitive advantage from information technology and supply chain management. To meet these global changes, organizational managers need to support their internal and external functions and seamlessly interface and exchange information with their supply chain partners by using ERP applications (Marinagi, Trivellas, & Sakas, 2014). Organizational leaders, particularly leaders in the manufacturing industry, must also implement a social sustainability supply chain practice that includes addressing social issues across the entire supply chain (Kaur & Puja, 2018).

Organizational leaders use ERP systems to support (a) the internal finance, (b) human resource, (c) marketing, and (d) operations of a business and SCM to deal with functionality beyond the boundaries of their organization (Handoko, Aryanto, & So, 2015). SCM is the process of integrating suppliers, customers, as well as strategic partners including external agencies. Organizational leaders use SCM to measure the relationships with their strategic partners. Supply chain management consists of the integration of multiple local and global suppliers and customers all critical to the production and dissemination of a product or service (Saber et al., 2014). According to Fuchs and Otto (2015), the two most influential values of SCM are demand fulfillment and available-to-promise functionalities.

The advancement in technology has led to the drastic change in SCM. According to Huang, Yen, and Liu (2014), technology process innovation and collaborative partnership are the crucial components of SCM integration. Marinagi et al. (2014) confirmed this notion by noting that for a SCM process to be sustainable, organizational managers must maximize their IT investment, which could lead to efficiency and profitability.

The primary objective of SCM is to improve the overall organizational performance and customer satisfaction by ensuring on time and on-schedule delivery of services and products to customers (Abdallah, Obeidat, & Aqqad, 2014). To achieve this objective, business leaders collaborate with various departments within the organization as well as with external customers and vendors. Zacharia, Sanders, and Fugate (2014) argued that organizational leaders implement ERP systems and SCM to align their strategic business processes with the goal of an efficient global organization. In many instances, the integration of ERP systems and SCM is part of an organizational effort to reorganize its IT infrastructure to improve supply and business processes. Both SCM and ERP systems lead to efficiencies and effectiveness within an organization and positively affect performance and competitive advantage.

A competitive advantage is necessary grounds for organizational leaders to differentiate their firms from competitors (Marinagi et al., 2014). Hsu (2013) noted that neither IT resources nor non-technical resources directly provide a competitive advantage. Instead, the combined effect of IT resources and organizational resources ultimately achieves competitive advantage.

Marinagi et al. (2014) identified (a) cost, (b) quality, (c) product delivery, (d) product advancement, and (e) time-to-market as the vehicles for achieving competitive advantage. Consumers demand quality products and instant services; as a result, organizational managers need to manage and monitor resources both inside and outside of the organization to remain competitive. Competitive advantage occurs when organizational leaders use their ERP system to enhance the sharing of information both within and outside the boundaries of a firm. Organizational leaders should invest and develop both ERP systems and SCM practices to increase their competitive gains (Handoko et al., 2015). Ince, Imamoglu, Keskin, Akgun, and Efe (2013) noted that competition is increasingly between supply chain partners more than among firms and for this reason, organizational leader must implement sound SCM practices. Ince et al. noted that both ERP systems and SCM have a positive effect on competitive advantage and firm performance.

Implementing an ERP system can achieve the objectives of sharing accurate information and increasing vendor and customer relationships and SCM performance (Huang et al., 2014; Marinagi et al., 2014). The supply chain partners and stakeholders include (a) manufacturers, (b) marketing teams, (c) suppliers, (d) transporters, (e) warehouses, (f) retailers, and (g) buyers and all must fully engage in the supply chain to add value to a product or service. Organizational leaders ultimately use their ERP system to ensure that their organization efficiently collaborates with their supply chain partners (Abdallah et al., 2014).

A critical component of SCM is supplier relations. The integration with value chain suppliers increases organizational performance. Organizational leaders use supply chain management to integrate material information, and planning business processes (Roh, Hong, & Min, 2014; Zacharia et al., 2014). Organizational leaders use the integrations to (a) enhance the sharing of information, (b) increase confidence in vendors and contractors, and (c) strengthen collaboration across the entire organization (Roh et al., 2014). Organizational leaders also use the integrations to enhance the relationship between the buyer and suppliers as well as knowledge sharing (Vanpoucke, Vereecke, & Boyer, 2014).

Abdallah et al. (2014) noted that supplier integration and information sharing does not significantly influence performance instead (a) management practices, (b) internal integration, and (c) customer integration positively affects performance. Organizational leaders must establish relationships between an organization and its suppliers. The lack of a useful relationship with a supplier results in failed communications with customers (Wolf, 2014). This vacuum could lead to unsettling relations and distractions along the entire supply chain.

The external integration module of an ERP system is a critical component of SCM supplier relationships (Ekman, Thilenius, & Windahl, 2014). Organizational leaders could use their ERP systems to enhance suppliers' capabilities leading to reduced risk of supply disruptions. Even though the internal integration of an ERP system is an important aspect, external integration is required for an efficient and effective way of managing a supplier network (Vanpoucke et al., 2014).

Organizational leaders use product development and vendor support to e increase their competitiveness (Vivaldini, De Matos, & Pires, 2017). Software vendors use their experiences to help organizational leaders increase the efficiency of their supply chain management. The choice of vendors directly relates to performance and the chance of competitive gains. According to Schniederjans and Yadav (2013), ERP vendors are a CSF in ERP implementation, and organizational leader must only deal with qualified vendors.

The success of an organizational operation and risk reduction of a SCM enterprise depends on adequate internal control mechanisms (Hsiung & Wang, 2014). Organizational leaders use internal controls to improve the inventory and demand effects in a supply chain system (Rushton, Croucher, & Baker, 2014). Organizational leaders require planning and accountability to maintain internal controls and use their ERP systems to manage internal controls efficiently (Hwang & Min, 2015). Both SCM and ERP systems lead to efficiencies and effectiveness within an organization and positively affect firm performance (Handoko et al., 2015).

Hwang and Min (2015) noted a direct relationship between ERP systems and SCM as well as operational performance and supply chain management that facilitates ERP system performance. Organizational leaders that implement SCM can take comfort in knowing that their ERP implementation will lead to operational performance. The significance of ERP on operational performance is noticeable at different levels of an organization by the contributions of the SCM business processes that consequently business leaders use to improve the overall performance of the organization.

Transition

In Section 1, I presented the problem statement that this study seeks to answer. The challenge is that ERP system implementations fail at an alarming rate (Garg & Garg, 2014). In this qualitative single-case study, I will explore the strategies that stakeholders in manufacturing use to improve ERP implementations to ensure on time and on budget project completion in a manufacturing firm in Ghana.

In Section 1, I presented the background of ERP systems. ERP systems consist of integrated applications providing decision makers with a holistic view of information of the organization, increasing transparency and accountability, while creating an integrated and seamless supply chain between the company, suppliers, and customers. Because the implementation of these ERP systems is complicated, organizational stakeholders need to understand the CSFs of ERP system implementation to expedited and improve the implementation time of ERP software projects to ensure on time and on budget project completion (Fadlalla & Amani, 2015; Garg & Garg, 2014).

Section 1 includes the purpose of the study as well the merits of implementing an ERP system. I chose a qualitative single-case study research design because knowledge collected from interviewing groups of people is a better predictor of human experiences than analyzing statistical variables (Denzin & Lincoln, 2011). In section 1, I also provided the research questions, identified the qualifications of participant, and location. Section 1 includes a discussion on the intent of the study by outlining the significance of the study to business practice and the implications for social change. The conceptual framework used to ground the study is the TOE framework. Section 1 also includes a

review of the professional and academic literature. The literature review section starts with the history of ERP systems, ERP current systems, ERP system benefits, ERP innovation and trends, and evidence of the ERP problem. The review of professional and academic literature continues with an analysis of the TOE conceptual framework and ERP implementation strategies. The literature review section concludes with an analysis of the primary ERP business process of knowledge management, customer relationship management, and supply chain management.

Section 2 of this study includes (a) a restatement of the purpose of the study, (b) a description of the role of the researcher, (c) the research participants, (d) the research method and design. This section also includes (a) a description of the population and sampling procedures, (b) data collection, (c) organization methods, and (d) the reliability and validity of the study. Section 3 will include the findings and an analysis of the results of this study. The findings will include a summary of my research experience. Section 3 will also include recommendations for future studies and a concluding statement regarding the overall contribution to the knowledge of ERP implementation in the manufacturing industry.

Section 2: The Project

In Section 2, I restate the purpose of the study. I also describe the role of the researcher in the data collection process, as well as the research methods used in this study. I provide information about the target population, selection process, research ethics, data collection, and instrumentation techniques to be used to analyze future findings. I concluded Section 2 with a discussion on the reliability and validity of the research instruments, a transitional summary of the fundamental topics, and an overview of Section 3.

Purpose Statement

The purpose of this qualitative single-case study was to explore the strategies that stakeholders in manufacturing used to improve ERP implementations to ensure on time and on budget project completion. The targeted population was five stakeholders in one manufacturing firm in Ghana who have been successful in using strategies to improve ERP implementations to ensure on time and on budget project completion. The findings from this study may have a positive social effect on local communities' social change as ERP implementation strategies help stakeholders in manufacturing increase employer profitability. As a result, those manufacturing firms could have extra funds available for corporate social responsibility projects such as funding for local schools, after-school youth programs, and philanthropic donations that may improve the condition of communities.

Role of the Researcher

Conducting scholarly research requires the researcher to collect data, perform analysis, and interpret the results (Taylor, Bogdan, & DeVault, 2015). The role of the researcher is to (a) manage, (b) review, (c) collect, and (d) analyze the data, as well as (e) interpret the findings (Malagon-Maldonado, 2014). Researchers also have a responsibility to be (a) objective, (b) clear, and (c) concise while articulating and interpreting the data (Malagon-Maldonado, 2014).

My role as a researcher required me to (a) choose a research method and design, (b) find willing participants, (c) interview the participants, and (d) analyze their responses. My goal was to interview participants who had directly participated in a successfully implemented ERP software project in a manufacturing firm in Ghana. I have experience in both the information technology field and with ERP implementation. I have also worked in the computer industry for 29 years and implemented enterprise systems for more than 2 decades. Despite having lived and worked in Ghana for many years, I had no personal or professional relationship with the research participants or the manufacturing company.

According to the ethical guidelines of the Belmont Report, a researcher must gain an understanding of ethical issues related to the research and the participants (Musoba, Jacob, & Robinson, 2014). The ethical guidelines extend to voluntary participation and the ethical role of the researcher (Musoba et al., 2014). To comply with the Belmont Report guidelines, I recruited voluntary participants only and treated participants with (a) respect, (b) kindness, and (c) impartibility. To prepare for this research study, I

completed the web-based training on protecting human research participants offered by the National Institutes of Health. I received my certificate of completion on January 15, 2015.

A researcher's worldview generates bias. A researcher with strong experience and background in the research topic could inadvertently introduce bias into the study (Taylor et al., 2015). Researchers must learn how to divorce their worldviews by a process known as bracketing (Malagon-Maldonado, 2014). Bracketing allows a researcher to contain their preexisting prejudices during the (a) interview, (b) analysis, and (c) documentation periods (Veletsianos & Kimmons, 2013). In a study by Veletsianos and Kimmons (2013), the authors implemented bracketing in their research on the use of technology and social networking websites to alleviate bias.

Other tools used to alleviate bias include journaling and member checking. To mitigate bias from the research processes, Sorsa, Kiikkala, and Åstedt-Kurki (2015) recommended keeping a journal and reviewing the notes with a third party. Flick (2014) suggested combining the reflexive field notes with workshops and seminars. Flick recommended that reflexive field notes be recorded after each workshop to capture the researcher's observations accurately. Simpson and Quigley (2016) suggested that the researcher should not only share a summary of the interview with the participants and ask the participants to check accuracy, but to also listen for plots and document participant reactions. This member checking process efficiently alleviates bias and safeguards the research from misinterpretations.

I tried to remain unbiased by keeping a reflexive journal. The maintenance of a reflexive journal will document observations not captured on the audio recordings, including interview location characteristics. I used member checking and consult with my doctoral study chair as an outside source. All three tools helped me in mitigating my personal bias, allowing me to acquire and analyze the semistructured interview responses with a subjective lens.

A research protocol process is a mechanism for the researcher to check the accuracy of their data collection process (Yin, 2017). I followed the interview protocol depicted in Appendix A. Castillo-Montoya (2016) suggested that an interview protocol is a structured process for collecting data. Wang, Xiang, and Fesenmaier (2014) used an interview protocol as a guide and as a means of establishing consistency and accuracy during their study of the acceptance, use, and influence of smartphones. To collect data uniformly, I followed the steps in the interview protocol.

Participants

The participants from the targeted population were five stakeholders from a manufacturing firm in Ghana, selected based on their experience in successfully implementing ERP software. In a qualitative case study, the researcher must ensure the qualifications of each participant (Yin 2017). At the start of the interview, I reviewed the consent form with each participant to ensure that each participant qualifies for the study. According to Taylor et al. (2015), the role of the researcher is to determine the sample size of the study. Yin (2017) indicated that case study researchers must establish the participants' eligibility criteria. I selected participants using similar criteria used by Shoup

(2015). The eligibility criteria required that participants be (a) a manufacturing leader who is an employee of the manufacturing firm in Ghana; (b) in possession of business process knowledge and experience related to the company's successful ERP system implementation; (c) willing to volunteer to participate in a semistructured, audio-recorded interview process; and (d) willing to allow publication of the collected data in my doctoral study and other publications.

I visited the business registry located in Accra, Ghana, to get a public list of manufacturing companies with contact information listed in their business directory. The business registry information included the name, phone number, and email of authorized officials. After getting a list of manufacturing companies from the business registry, I called and emailed authorized officials to determine the companies that were interested and eligible. I asked each authorized representative whether they had successfully implemented an ERP and if they have used strategies to improve ERP implementation at their organization. I selected one company that has the most recent successful ERP implementation experience and has offices and employees located in the city of Accra. The advantage of this geographical location was that I was able to commute within reasonable distance to the participants during data collection. I asked the authorized official for the HR director or person in charge of human resources. I contacted and ask the person in charge of human resources to solicit and introduce me via e-mail to stakeholders who had expressed interest in participating. I sent a recruitment letter to each potential participant along with a consent form via e-mail.

The engagement process included sending a letter of cooperation via email to the HR director or person in charge of human resources at the manufacturing companies to confirm the company's willingness to participate in the study. After I sent the recruitment letter, I followed up with a phone call to each potential participant to ask for their participation and answered any questions or concerns that they had. I reviewed the participants completed consent forms and selected five stakeholders. If I had received fewer than five participants, I would have asked the person in charge of human resources to solicit additional stakeholders for consideration.

According to Yin (2017), trust is the critical component for a successful interview. Yin noted that the researcher must respect the time and effort that a participant commits to the interview. In effect, a researcher must establish relationships with the participants. The relationship between the researcher and the participant determines the quality of the data (Malagon-Maldonado, 2014). Castillo-Montoya (2016) suggested that establishing relationships based on trust leads to quality answers from the participants. To develop the relationship, Yin (2017) suggested that researchers should conduct interviews in a place that is safe and conducive to sharing personal information. Participants should trust that the researcher would maintain confidentiality (Huang, OConnor, Ke, & Lee, 2016). Upon receiving institutional review board (IRB) approval, I established a working relationship and strived to build trust with the participants to alleviate any anxieties or anticipation of a negative experience on the part of the participants. I built trust and established a working relationship by corresponding with potential participants via email and phone to introduce (a) the study, (b) the interview protocol, and (c) myself. I asked

potential participated to ask questions and responded to their inquiries. These correspondences commenced after obtaining my IRB approval and prior to commencing data collection.

Research Method and Design

The objective of this qualitative single-case study was to explore the strategies that stakeholders in manufacturing used to improve ERP implementations to ensure on time and on budget project completion. The targeted population were five stakeholders from one manufacturing firm in Ghana who have been successful in implementing ERP software projects. The following is a discussion of the research method and design for this study.

Research Method

According to Yin (2017), the goal of a researcher is to identify a research method that answers the research question. Studies geared toward business and social research tend to use qualitative, quantitative, and mixed methods to obtain information (Venkatesh, Brown, & Bala, 2013). The research method and design for this study is a qualitative single-case approach to explore the strategies that stakeholders in manufacturing use to improve ERP implementations to ensure on time and on budget project completion. I chose a qualitative method instead of a quantitative or mixed method because knowledge collected from interviewing groups of people is a better predictor of human experience than analyzing statistical variables (Denzin & Lincoln, 2011).

Taylor et al. (2015) noted that qualitative research involves determining the meaning of the conversation with participants, instead of simply analyzing data. According to Marshall and Rossman (2015), qualitative research involves multiple facets of life, including (a) human interactions, (b) witnessing the development of concepts, and (c) the observation of the duplication of ideas. Merriam (2014) echoed this thought by suggesting that qualitative research offers the opportunity to use interview protocol and emerging technologies to gather information on evolving views.

I have also reviewed quantitative and mixed methods methodologies. According to Fellows and Liu (2015), a quantitative research method involves mathematical models, theories, and hypotheses about phenomena. A quantitative research study includes statistical data to validate or test theories as well as the relationship between the defined variables of a study (Brown & Coombe, 2015). Quantitative research involves evaluating a phenomenon based on statistics with the intent of testing a theory (Denzin & Lincoln, 2011). I did not use mathematical models, hypotheses, or examine the relationships among variables because the objective of this study was not to examine quantitative variables.

Mixed method studies include the use of both qualitative and quantitative methods to explore a phenomenon (Denzin & Lincoln, 2011). A mixed method approach was not suitable for this study because the study purpose was to explore strategies needed to implement and improve ERP software projects not examine relationships between ERP software project variables. By using a qualitative methodology, I was able to understand the strategies that manufacturing firms used to implement an ERP system successfully based on the participants' knowledge and familiarity with the ERP implementation.

Research Design

Qualitative design options include, case study, phenomenology, and ethnography. A case study design has an advantage because the explorations of a variety of data sources help deepen the understanding of a study (Malagon-Maldonado, 2014). According to Singh (2014), a case study design involves the exploration of the natural environment of the survey and the opportunity to study the current state. Yin (2017) argued that in a case study the researcher explores, describes, and documents a phenomenon of a present stage. Case studies enable the illustration of events, merge ideas from multiple sources, and are an efficient way of answering the how, why, and what of a phenomenon (Yin, 2017).

Researchers in a phenomenology design explore lived experiences and perceptions (Moustakas, 1994). The objective of the researcher is to describe the characteristics of culture as well as extrapolate on the actual life experiences of the participants (Moustakas, 1994). Vagle (2016) noted that phenomenological design focuses on the view of the people who have lived the researched phenomenon. This design would not have supported this study because the phenomenological design focuses exclusively on the subjects' life experiences in their culture or social class. I chose a case study design because as stated by Swanier (2016), case study research is suitable for exploring new technology implementation projects.

Marshall and Rossman (2015) indicated that in an ethnography study the researcher explores a human society based on the total involvement of the culture and the everyday life of the subjects. This research design would not have been suitable for this

study either because it involves research of cultural groups and the daily lives of participants (Yin, 2017). The broad nature of case study research enables the breadth of studying human experiences (Baškarada, 2014). The use of case study exceeds that of other qualitative approaches, because of its range (Hyett, Kenny, & Dickson-Swift, 2014).

As a case study researcher, I explored multiple data sources to deepen my understanding of the themes (Malagon-Maldonado, 2014). When a researcher no longer discovers new emerging themes from the interviewing process, the researcher has reached data saturation (Elo et al., 2014). Regardless of the research design method chosen, data saturation for qualitative research is achievable with small sample sizes (Bernard, 2013). I interviewed five stakeholders from the manufacturing firm. Data saturation is a requirement for qualitative single-case studies (Yin, 2017). To achieve data saturation, I (a) interviewed, recorded, and analyzed the responses; (b) updated journal notes to ensure reflexivity; (c) provided participants with a summary of the interview responses for the participants to validate to ensure accuracy; and (d) conducted follow-up interviews until data saturation occurs.

Conducting interviews to support this qualitative single-case study requires guidance for achieving data saturation (Yin, 2017). I recorded and analyzed responses from the five participants. After interviewing the five participants, I concluded the interviews and reviewed each participant's responses to the questions. After I completed the assessment of the five participants' answers to the interview questions, I scheduled follow-up interviews to discuss and clarify information to ensure that I had correctly

noted the participants' responses. For the objectives of member checking, the participants received an e-mail copy of a summary of the interview to confirm the information is accurate and complete. Participants had 2-days to respond to my email. The participants responded to my inquiries for feedback on time. The participants did not make any changes to the summary of the interview. To achieve data saturation, I followed-up and asked probing questions to ensure no new themes existed. According to Fusch and Ness (2015), data saturation helps determine the proper sample size a researcher should use.

Population and Sampling

Determining the proper sampling in a qualitative study is critical because the objective and intent are to select interview participants, not to count or record the number of opinions (Taplay, Jack, Baxter, Eva, & Lynn, 2014). According to Taplay et al. (2014), purposeful sampling is a tool to identify significant participants with experience with the research topic. Taplay et al. noted that to maximize the benefits of purposeful sampling, the researcher must include participants with a variety of roles. According to Taplay et al., the researcher must ensure that the sample is from the correct community in which the study originates. Taplay et al. noted that the participant could provide insights that will help answer the research question in the survey.

Purposeful sampling is a tool to identify participants whose knowledge would yield consistency of emerging themes (Padgett, 2016). Robinson (2014) argued that the knowledge of the population from the perspective of the researcher helps in defining the right sample. This qualitative single-case study involved a purposive sampling of five

stakeholders in manufacturing who meet the study participant eligibility criteria as follows: (a) a stakeholder and an employee of the manufacturing firm in Ghana, (b) had experience related to the successful ERP implementation at the firm, (c) had a willingness to volunteer to participate in a semistructured audio-recorded interview, and (d) had the willingness to allow the publication of the collected data in my doctoral study and other publications.

Determining the sample size of a qualitative research study is an important step in planning stages of the research study (Yin, 2017). Yin mentioned that a sample size of two or three participants is adequate for a qualitative case study research. Yin cautioned that the size of the sample is not as relevant as the ability to reach data saturation. Elo et al. (2014) noted that researchers do not recommend an ideal sample size for qualitative studies because the sample size depends on many factors including the purpose of the study and the research question. According to Fusch and Ness (2015), the researcher achieves an ideal sample size when data saturation occurs (Fusch & Ness, 2015). Bernard (2013) argued that a small sample size is adequate for reaching data saturation for qualitative research. I used a purposeful sampling of five participants who were eligible and interviewed them until I no longer obtain new emerging themes.

Ghana has several major businesses, including (a) manufacturing, (b) mining, (c) banking, and (d) financial services (www.gipcghana.com/invest-in-ghana/sectors.html). Based on my personal and professional knowledge, several organizational leaders had implemented ERP systems. This information was the motivation behind my decision to conduct my research in Ghana. I used purposeful sampling of five stakeholders in

manufacturing who work in various roles, such as project executive, project management, inventory management, systems, finance, human resource, information technology, and customer relations management. I interviewed participants until no new themes emerge.

Ethical Research

The autonomy of a participant is critical to the authenticity of the research (Musoba et al., 2014). The voluntary participation of a subject constitutes the foundation of a research study (Padgett, 2016). The submitting and obtaining a consent form indicates the willingness of the participant to voluntary participate in the study (Taylor et al., 2015). Yin (2017) echoed this point by noting that interviewees must acknowledge their voluntary role in the research.

Silverman (2016) argued that participants must be aware of their right to refuse to participate and be mindful of how the researcher will protect their identity and the answers they provide. The participants must also be cognizant of how the researcher intends to use their responses and their rights regarding withdrawing their signed consent (Silverman, 2016). To achieve this, I provided each participant with a consent form. Details of the consent form included information regarding the nature and purpose of the study, how I would maintain confidentiality, my responsibilities and the responsibilities of the research participants. The consent form included (a) voluntary participation, (b) the right to withdraw or terminate the interview at any time, (c) the right to remove any responses at any time before the publication of the study, and (d) the warehousing of interview responses in a safety deposit box for 5 years. The consent form included the Walden University IRB approval number 04-10-18-0467228.

The researcher must safeguard the participant's information to ensure confidentiality (Killawi et al., 2014). According to Holloway and Galvin (2016), the researcher must ensure that none of the participant's information becomes public information. Huang et al. (2016) argued that most participants have the reputation of contributing only if the researcher assures them of confidentiality. To achieve confidentiality, I used a coding scheme, instead of the name of participants. I will also keep all the raw data, including (a) handwritten notes, (b) audio recordings, (c) interview transcripts, and (d) reflective notes in a fireproof safe-deposit box for 5years. I will destroy all material related to this study after 5 years by deleting the audio recordings, deleting the Microsoft Word files that contain interview transcripts and reflective notes, and shredding all handwritten notes.

In a case study, the researcher must keep information about the participants confidential (Taylor et al., 2015; Yin, 2017). According to Musoba et al. (2014), the researcher must protect the participants by abiding by principles, such as the Belmont ethical guidelines. These guidelines constitute the pillars that ethically steer a researcher to avoid disrespecting the participants and infusing partiality (Musoba et al., 2014). These principles guide the researcher to protect the identity of the participants and privacy of their responses (Musoba et al., 2014). I commenced recruiting potential participants only after receiving approval from Walden University's Institutional Review Board.

An incentive is a reward given to a research participant to encourage their contribution (Taylor et al., 2015). Klitzman et al. (2013) argued that stimulus represents disproportionate rewards for encouraging participants to take part in the research

interview. I worked on establishing a cordial business relationship by building trust; which could yield quality data (Malagon-Maldonado, 2014; Yin, 2017). I did not offer participants any incentives.

Data Collection Instruments

In a qualitative research study, the researcher is the primary data collection instrument (Taylor et al., 2015). The standard four data collection techniques are locality participation, direct observation, interviews, and document analysis (Marshall & Rossman, 2015). According to Yin (2017), in qualitative single-case studies, asking questions of research participants is the primary technique. According to Castillo-Montoya (2016), the fundamental function of interviewing is to garnish the experiences of an interviewee and their perception of their experience as it relates to the research question. In this research study, I was the primary data collection instrument, and I used a semistructured interview technique to explore strategies that stakeholders in manufacturing used to implement ERP systems successfully.

Castillo-Montoya (2016) defined an interview protocol as a guide for interviewing research participants. Castillo-Montoya suggested that an interview protocol controls the flow and sequence of questions. I followed an interview protocol (see Appendix A) as a means of establishing consistency and accuracy in collecting data (Wang & Wang, 2014). I recorded each interview on an iPhone, transcribed the audio recordings, and saved the notes to a Microsoft Word document. I then analyzed the data with NVivo12 software and composed a table of emerging themes and patterns in a Microsoft word file.

Marshall and Rossman (2015) argued that member checking is the process of a study participant reviewing a summary of the interpreted notes for validation. Malagon-Maldonado (2014) suggested that member checking involves the verification of the interview summary by the study participant. Wang and Wang (2014) used member checking during their study of the acceptance, use, and influence of smartphones. I used member checking by providing participants with a summary of the interview for the participant to validate. To ensure a comprehensive data collection, I asked respondents to affirm that the themes that I found represented their responses. To ensure the integrity of the study, I exercised impartiality, protected the identity of participants, and kept all data confidential.

According to Yin (2017), the four types of triangulation include (a) data triangulation, the use of multiple sources of evidence such as interviews, document review, and observations; (b) investigator triangulation using different evaluators to review data; (c) theory triangulation, which uses different viewpoints to analyze the same dataset; and (d) methodological triangulation, which refers to the use of different methods. Methodological triangulation is an approach to help researchers understand the data (Yin, 2017). According to Carter, Bryant-Lukosius, DiCenso, Blythe, and Neville (2014) methodological triangulation is the method of using multiple data sources to develop a phenomenon. Ravitch and Carl (2015) noted that the use of multiple sources of data strengthens the validity of a case study. According to Carter et al. (2014) methodological triangulation is the process of using various data sources, including (a) interviews, (b) reflexive notes, and (c) documentation to develop phenomena. For this

study, I used methodological triangulation by using the data sources of (a) interviews, (b) corporate documents, and (c) reflective journal. The corporate documents included (a) Project Goals presentation June 2013, (b) Go-Live Optimization presentation January 2014, and (c) Re-Order Analysis Report January – June 2017 related to the successful ERP system implementation at the manufacturing firm. These three documents provided details on the ERP strategies that were used during the implementation. I asked an authorized official and each participant for these documents and studied the documents for strategies related to the context of technology, organization, and environment from the ERP implementation at the manufacturing firm.

Data Collection Technique

The data collection process is the method that enables researchers to answer the central research question: What strategies do stakeholders in manufacturing use to improve ERP implementations to ensure on time and on budget project completion? I started the data collection process after I received my Walden University IRB approval. I then performed the following steps: (a) I asked the authorized officer in the organization to identify and introduce me via email to the ERP implementation project manager in the organization; (b) the ERP implementation project manager introduced me via e-mail to stakeholders who had expressed interest in participating; (c) I sent a recruitment letter to each potential participant along with a consent form via e-mail; (d) I then followed up with a phone call to each potential participant to ask for their participation and answered any questions or concerns that they had; (e) I developed a schedule based on the feedback from the potential participants; (f) I conducted all the interviews on-site at the

manufacturing company in Ghana; (g) each interview session commenced with a review of the consent form. I ensured that each candidate meets the qualifications based on the questions on the consent form; (h) I used the interview protocol (see Appendix A) as a guide to ensure consistency of the interview approach.

Fellows and Liu (2015) noted that because of the ability to combine the results from different sources, case study research has a solid foundation. Ravitch and Carl (2015) noted that by triangulation, a process of combining the results from different sources, the researcher strengthens the validity of the case study. Antwi and Hamza (2015) recommended that to obtain a comprehensive set of data, a researcher must observe the interview location surroundings and body language of participants, take interview notes, keep a reflexive journal, and seek organizational documents. I maintained field notes to capture my reflections and views to mitigate my personal bias. Yin (2017) suggested that field notes capture the thoughts and comments of a data collection activity. I used the data collection techniques of semistructured and face-to-face interviews, review of relevant corporate documents, and reflective journal. I used open-ended interview questions to collect information that helps answer the research question of this study.

According to Yin (2017), in qualitative single-case studies, interviewing is the most frequently used technique. Marshall and Rossman (2015) suggested that interviews are a casual method of collecting data in a qualitative case study. Further, Taylor et al. (2015) recommended face-to-face interviews to build trust with the participants. The process of collecting data through interviewing has shortcomings, because of the time and cost

involved, as well as the tendency for partiality (Padgett, 2016). According Bevan (2014), a researcher may misunderstand the initial response and the participant's elaboration to a follow-up question. To mitigate misunderstands, I asked several follow-up questions and held detailed discussions on each response. In addition, I used member checking to mitigate my misunderstandings.

According to Yin (2017), organizational documents include (a) government, (b) employee, and (c) project remnants. As part of the interview process, I ask for corporate documents related to the ERP implementation project. Participants provided me with the following documents: (a) Project Goals presentation June 2013, (b) Post Go-live Optimization presentation January 2014, and (c) Re-Order Analysis Report January – June 2017. Organizational documents are one component of methodological triangulation (Fellows & Liu, 2015). Merriam (2014) suggested that corporate documentation is a primary data collection component of qualitative research. For example, Gibbons (2015) studied strategies to enhance revenue in the small business industry and used document analysis. For this study, I analyzed the ERP strategic plans and sales analysis document used during the ERP implementation project at the manufacturing firm.

Organizational document analysis has strengths and weaknesses. The possible advantages include the fact that the papers could be readily available and accurate (Fellows & Liu, 2015). During the interview process, I requested and received copies of corporate documents including (a) Project Goals presentation June 2013, (b) Post Go-live Optimization presentation January 2014, from the head of IT and (c) Re-Order Analysis

Report January – June 2017 from the storeroom manager. The other managers had no ERP implementation documents to share.

The weaknesses include the possibility of the researcher misunderstanding the content and the risk of few relevant documents (Ravitch & Carl, 2015). For misunderstood content, I followed-up with the participants to obtain clarifications. I asked follow-up questions during the interview and sent emails after the interview. For example, I misunderstood the government regulations pertaining to tax identification and tax stamp features reported by participants. Several participants mentioned the implementation of the corporate tax identification number and tax stamp on consumer products. I asked several follow-up questions during the interviews and via email which led to the explanation that implementing a tax stamp on consumer products is a future implementation requirement. However, the manufacturing firm already prints tax identification numbers on consumer products.

During the interview process, I followed the interview protocol (see Appendix A) and conducted interviews on-site in a conference room with each interview lasting 30 minutes along with follow-ups as necessary. I did not provide any incentives because participation was voluntary. I recorded the interviews using an iPhone. I used the iPhone Voice Memo application for all recordings. The application was intuitive and produced a universally compatible audio file. I did not use a portable recording device such as EVISTR voice recorder because (a) such devices tend to skip a few seconds during playback, (b) do not have Bluetooth capabilities, and (c) do not have password feature to increase confidentiality. I maintained a reflective journal that I used to document my

personal comments during the data collection process. I used the reflective journal to mitigate my personal bias. I generated themes and sub themes that reflected ERP strategies used by the manufacturing firm by analyzing my journal, the interviews, and the 3 corporate documents.

I recorded each interview on an iPhone. I manually transcribed the audio recordings without the use of a Livescribe pen or audio to text convertor. I did not use an audio-to-text converter because of the challenges that such devices have with transcribing local accents. All the data collected will be stored in a fireproof safe deposit box for5 years to comply with research ethics rules. I will shred all the paper documents and delete the digital recordings from the iPhone.

Data Organization Technique

Data collection constitutes an array of domains that allows the researcher to build a relationship with participants (Padgett, 2016). According to Malagon-Maldonado (2014), the benefit of organizing data includes easy retrieval and management of data collected. Innovative technologies have user-friendly capabilities to store and retrieve data (Khan, 2014). Marshall and Rossman (2015) echoed the need for an easy retrieval system to collect data for analysis. Further, Yin (2017) mentioned the need to format, label, and formally categorize interview notes. The benefits of a case study database include the ability to retrieve the raw data of research for analysis as well as making the raw data accessible to external users. Database systems have the added capability of cross-referencing related data and audit trails.

After I interviewed participants, the interview notes and digital recordings remained in a secure folder until the data analysis phase. I used a software program such as NVivo®12 to (a) organize, (b) analyze, and (c) manage the raw data. I used Microsoft Word and Microsoft Excel programs to store and organize data and NVivo®12 for data analysis. I manually transcribed the audio recordings from digital recording to Microsoft Word for each interview. Yin (2017) recommended transcribing the digital recording right after the interview. I completed all data processing within 1 day of each interview to minimize human error in transcribing and interpretation the audio recordings. I saved all relevant documents in labeled file format and categorized the files using identifiers. I established individual folders with the unique identifier codes such as P001 through P005 for each of the five participants to ensure efficient data gathering. Ram and Corkindale (2014) studied the CSFs for ERP implementation using an open coding system. Gajic, Stankovski, Ostojic, Tesic, and Miladinovic (2014) also studied CSFs for implementing a successful ERP system. Further, Stankovski et al. used open coding systems to derive emerging themes. Aligning with Ram and Corkindale and Gajic et al., I used an open coding scheme, such as P001 through P005 to represent each participant. I used the open coding scheme to examine interview questions for emerging themes. I reviewed the data, wrote important notes, conducted member checking, and uploaded the data into NVivo®12 software.

Upon conclusion of the interviews, I have saved all the interview notes in a computer folder corresponding to the unique identifier assigned to each study participant, shredded the hard copies after I backed up copies of my data and study, and stored copies

in my home office. Yin (2017) argued that maintaining a research journal was a useful approach for data organization. I developed a journal file containing interview notes during the interviews, and then arrange them in categories and descriptions from interview responses. Data security will include storing all raw data in a locked safe for 5years after the completion of the study.

Marshall and Rossman (2015) suggested that researchers categorize and label data for consistency. I saved all relevant documents in labeled file format and categorize the files using identifiers. I will keep data stored on an external hard drive and a backup copy in a safe place for 5 years following the end of the study. Upon completion of this doctoral study, I will maintain the electronic data and all printed study information for 5 years, then shred the printed materials and delete the digital data to protect the confidentiality of the participants.

Data Analysis

Yin (2017) defined data analysis as the combination of several schemes such as grouping or categorizing to help answer the research question. Yin recommended six data analysis steps for qualitative research (a) read through all the data, (b) make the data ready for analysis by compiling and organizing the data, (c) disassemble the compiled data into fragments to begin detailed analysis using a coding scheme, (d) reassemble the data into sequence of groups or themes, (e) interpret the meaning of the themes, and (f) develop an interpretation or meaning of the data. I used this data analysis approach for this study.

According to Silverman (2016), the data analysis process is a reoccurring and continuous process commencing with the data collection phase until the end of the study. Methodological triangulation is the use of multiple data sources to develop a phenomenon (Carter et al., 2014). Ravitch and Carl (2015) noted that the use of multiple data sources strengthens the validity of a case. According to Carter et al., methodological triangulation involves employing multiple data sources to develop a comprehensive understanding of phenomena. The use of this methodology enhances the credibility of the study and helps achieve data saturation. I used methodological triangulation using the data sources of (a) interview, (b) organizational document, and (c) reflective journal. The organizational documents, including (a) Project Goals presentation June 2013, (b) Go-Live Optimization presentation January 2014, and (c) Re-Order Analysis January – June 2017 related to the ERP system implementation at the manufacturing firm. I generated themes and sub themes that reflected ERP strategies used by the manufacturing firm by analyzing my journal, the interviews, and the 3 corporate documents.

Innovative technologies have user-friendly capabilities to store and retrieve data (Khan, 2014). According to Padgett (2016), the advantage of technology includes the researcher's ability to analyze collected data by using database management systems and software tools. Researchers use data analyses tools to generate patterns and associations (Malagon-Maldonado, 2014). These patterns and relationships intertwine and lead to themes and subthemes that help answer the research question (Smith & Noble, 2014).

Castleberry (2014) noted that quality data analysis (QDA) software tools such as NVivo software facilitate open coding. Researchers can use the NVivo©12 software to

manage and analyze data (Rodik & Primorac, 2015). Researchers use NVivo software to aid in (a) data management, (b) coding, (c) sorting, and (d) organizing the data in themes (Sotiriadou et al., 2014). I downloaded and tested trial versions of two QDA software tools. The two QDA software tools were the atlas.ti 8.0 and NVivo 12. Based on my personal experience with both software products, I did not use the atlas.ti 8.0 because the NVivo 12 software is more intuitive with features such as (a) text search, (b) matrix coding, and (c) coding comparison queries. I analyzed the data using NVivo©12 software. As a result, patterns and themes emerged that answer the research question. I used NVivo 12 to store, manage, code, and analyze the data collected from interviews by employing inductive reasoning and exploring interrelated themes and subthemes.

By thematic analysis, researchers can correlate the themes of the literature and conceptual framework. Researchers use thematic analysis to (a) examine, (b) identify, and (c) record meaningful themes within the data collected (Teruel, Navarro, González, López-Jaquero, & Montero, 2016). Researchers can also use thematic analysis to describe how the subthemes combine into a theme (Pascoal, Narciso, & Pereira, 2014). Researchers should ensure that identified themes relate and directly address the research question (Braun, Clarke, & Terry, 2014). I used the NVivo 12 software thematic analysis functionality to categorize data into meaningful themes. The conceptual framework used to ground this study is the TOE theory. The emerging themes and subthemes mapped directly to the elements of TOE framework. I have linked the findings to professional and academic literature and the TOE conceptual framework.

Reliability and Validity

Reliability and validity are qualitative research quality measures (Yin, 2017). According to Denzin and Lincoln (2011), the leading components of reliability and the validity of a qualitative research study include (a) dependability, (b) credibility, (c) transferability, and (d) confirmability. These components map directly to internal validity, external validity, reliability, and objectivity (Malagon-Maldonado, 2014).

Reliability

The dependability of a qualitative research study is a CSF (Marshall & Rossman, 2015). According to Yin (2017), to ensure the dependability of a qualitative research study requires a case study protocol and a data analysis software. Dependability means that the qualitative research must be repeatable (Malagon-Maldonado, 2014). According to Padgett (2016), dependability is a comprehensive implementation of the qualitative research study. Similarly, Elo et al. (2014) suggested that dependability signifies the ability of a future researcher to repeat the study with similar results. Dependability results from research interview controls, such as reflexivity (Denzin & Lincoln, 2011). For example, in a study of the use of smartphones by millenniums, Chan, Walker, and Alan (2015) used reflexivity.

I maintained interview controls through reflexivity by keeping a reflective journal to ensure dependability of this study. Other dependability strategies include member checking and data analysis (Yin, 2017). I provided participants with summaries of my interpretation of their interviews to ensure that I had accurately summarized the interviews. Participants had 2 days to respond to my email. The participants responded to

my inquiries for feedback on time. The participants did not have any changes to the summaries of my interpretations of their interviews. I sent these documents to participant via email within 24 hours after the interview. Malagon-Maldonado (2014) suggested that member checking involves the verification of the summary of an interview with a study participant. Sotiriadou, Brouwers, and Le (2014) recommended the use of software and database technology, such as NVivo 12, to ensure data dependability.

Validity

According to Venkatesh et al. (2013), credibility stems from the trust that the participants have in the research study. Further, Denzin and Lincoln (2011) noted that credibility emanates from a series of activities. Denzin and Lincoln recommended triangulation, member checking, and peer review. Furthermore, Malagon-Maldonado (2014), peer review enhances the creditability of the collected data from the perspective of interpretation. The correct interpretation of the research data collected as well as seeking expert advice is critical to the credibility of a qualitative study (Merriam, 2014).

According to Elo et al. (2014), member checking is critical to the credibility of a qualitative study. The practice of asking participants to verify the interpretation of an interview lends credibility to the study (Simpson & Quigley, 2016). According to Simpson and Quigley (2016), researchers must allow participants to read a summary of the interview and verify the accuracy of the researcher's interpretation. Taylor et al. (2015) recommended allowing participants to check the interview summary as a tool for ensuring confidence and credibility.

By the process of member checking, the researcher follows up with the participants until data saturation (Bernard, 2013). Data saturation is a significant achievement of qualitative single-case (Yin, 2017). To achieve data saturation means that the researcher has asked probing questions and followed up with the participant until no new themes emerge validating the sample size (Fusch & Ness, 2015).

Carter et al. (2014) recommended methodological triangulation as critical to establishing the credibility of a qualitative study. To ensure methodological triangulation and member checking, Robinson, Solnet, and Breakey (2014) used multiple sources, including (a) audio recording, (b) reflective notes, and (c) organization documentation. Robinson et al. provided the participants with a summary of the interview for their verification and validation to ensure accuracy and credibility.

I used the practices of methodological triangulation and member checking to ensure credibility for this study. I used methodological triangulation, namely the data sources of (a) interview, (b) organizational document, and (c) reflective journal. To practice member checking, the participants received an e-mail copy of my interpretation of the interview responses to review and provided feedback.

Trust, stemming from a good relationship with participants, is a significant contributor to the success of a qualitative case study (Padgett, 2016; Yin, 2017). Consequently, one of the ways to build trust is by conducting the research onsite (Huang et al., 2016). Huang et al. noted that a researcher should spend enough time on-site as a way of building trust and gaining a complete picture of the environment. Padgett (2016) echoed this point by asserting that the researcher must build trust and embrace the

intricacies of the environment to understand the research scope. I spent enough time at the manufacturing firm to build a relationship with the participants and ensured trust to better understand the extent of the research. The site visit occurred after obtaining my IRB approval and before commencing data collection.

Creditability is achievable through case analysis. Antwi and Hamza encouraged researchers to perform a detailed case analysis as a tool to determine disputable categories, as well as confirm emerging patterns. Malagon-Maldonado (2014) echoed the use of case analysis by recommending the use of referential adequacy. Malagon-Maldonado suggested referential adequacy as a tool for identifying a subset of data that the researcher should archive and use the archived data later in the process to validate the research findings. Conversely, Padgett (2016) recommended analyzing archived data as part of referential adequacy as a tool for assessing the validity of research findings.

I conducted a detailed analysis to determine disputable categories. I also confirmed emerging patterns and used referential adequacy case analysis to analyze archived data as a means of validating the research findings. I enhanced the credibility of this study by using a semistructured interview, drawing on my 29 years of IT industry experience and 20 years of enterprise systems experience, as well as my knowledge of research methodology.

Transferability in qualitative case study research is a function of other researchers (Venkatesh et al., 2013). Transferability in qualitative research is the generalization of the research findings to similar organizations (Venkatesh et al., 2013). According to Yin (2017), a case study researcher uses small samples, instead of generalizations. Small

sample size research, such as this study of five participants, could skew the transferability of the results (Yin, 2017). According to Merriam (2014), determining the compatibility of research projects to determine transferability, by comparing the methods and findings, is a good practice. Silverman (2016) recommended that researchers understand their methods and findings.

For an interested party to (a) review, (b) compare, and (c) make informed decisions about the transferability of a research study, Denzin and Lincoln (2011), recommended thick description. According to Bloomberg and Volpe (2015), thick description is the level of details of the study findings. The richness of the research findings enables other researchers to evaluate the study (Bloomberg & Volpe, 2015). A research study is transferable if another researcher can replicate the study (Yin, 2017). I provided thick descriptions that could enable future researchers to understand the strategies that stakeholders use to implement ERP systems and could help future researchers make informed decisions regarding transferability.

According to Venkatesh et al. (2013), confirmability is the degree to which another researcher can validate the findings of qualitative research. Padgett (2016) defined confirmability as the process of a researcher receiving verification and validation of the research findings. Yin (2017) suggested that confirmability refers to the degree to which the result of one study supports another study of similar characteristics.

The qualitative case study research strategies for confirmability include methodological triangulation and reflexivity (Denzin & Lincoln, 2011). Recommended strategies for confirming the results of a qualitative research case study include

methodological triangulation and reflexivity (Chan et al., 2015; Ravitch & Carl, 2015). Methodological triangulation strengthens the validity of a case study (Ravitch & Carl, 2015). Reflexivity ensures controls over an interview process (Chan et al., 2015). I used methodological triangulation and reflexivity to strengthen the confirmability and validity of this case study.

Transition and Summary

Section 2 began with the restatement of the purpose statement for this qualitative single-case study. The purpose of this qualitative single-case study was to explore the strategies that stakeholders in manufacturing used to improve ERP implementations to ensure on time and on budget project completion. Section 2 detailed (a) the roles of the researcher, (b) the participants in the study, and (c) ethical considerations. Section 2 also described (a) the population and sampling techniques, (b) data collection instruments, (c) data collection techniques, (d) data organization techniques, (e) data analysis, (f) reliability and validity.

Section 3 includes the findings of the completed research and the importance of the results to professional practice. The study addressed strategies that stakeholders of a manufacturing firm used to successfully implement their ERP system. I discussed (a) the implications for social change, (b) recommendations for actions and (c) further study, and (d) reflections. I provided conclusions with recommendations for future studies.

Section 3: Application to Professional Practice and Implications for Change

Introduction

ERP implementation strategies map to the contextual factors of technology, organization, and environment. Organizational leaders continue to invest in ERP projects, though projects fail at an alarming rate. Organizational leaders combine technology, organization, and external pressure elements during ERP system implementation to gain digital transformation that results in competitive advantage (Garg & Garg, 2014; Kilic et al., 2014; Ram et al., 2014). Consequently, organizational leaders need to understand ERP system implementation strategies to enhance their abilities to achieve competitive advantages. The purpose of this qualitative single-case study was to explore the strategies that stakeholders in manufacturing used to improve ERP implementations to ensure on time and on budget project completion. Stakeholders of the manufacturing firm provided answers to the interview questions that served as primary data and corporate documents that served as secondary data such as (a) project goals presentation, June 2013; (b) go-live optimization presentation January 2014; and (c) re-order analysis report January, June 2017.

I explored how a manufacturing firm in Ghana implemented SAP software successfully. I used the TOE conceptual framework as a lens to ground the study. The principle tenets of the TOE theory are (a) features of technology, (b) the readiness of an organization, and (c) the environmental conditions of a firm that drives the adoption of innovation (Schniederjans & Yadav, 2013). The data that I collected were analyzed using NVivo 12. The analysis showed an alignment between main themes and the elements of

the TOE conceptual framework and peer-reviewed literature. I analyzed all the primary data and secondary data and identified 14 emergent themes. I grouped the 14 emergent themes into four main themes. Table 1 displays the most frequently identified themes that I observed in the primary and secondary data. I have ranked the themes from most to least frequent among the four main themes. The main themes included (a) human and technical infrastructure resources, (b) top management support, (c) change management, and (d) reasons for ERP system implementation.

Table 1

Frequency of Themes for Successful Strategies for Implementing an Enterprise Resource Planning System

% frequency of Theme	*n*	Occurrence
Change management	49	39
Reasons for ERP system implementation	33	26
Top management support	24	19
Human and technical infrastructure resources	20	16

Note: *n* = primary and secondary data theme frequency ranked as most to least frequent; ERP = enterprise resource planning.

The analysis revealed that the four main themes embody ERP strategies that organizational leaders must understand to implement an ERP system successfully. The findings of this study showed that stakeholders need to fully understand the technical, organizational, and external complexities of implementing ERP systems. Success in ERP system implementation results from a combination of strategies that align with the TOE theory.

Presentation of the Findings

My objective in this qualitative single-case study was to explore the strategies that stakeholders in manufacturing use to improve ERP implementations to ensure on time

and on budget project completion. I embarked on a qualitative single-case study of a manufacturing firm in Ghana to answer the overarching research question: What strategies do stakeholders in manufacturing use to improve ERP implementations to ensure on time and on budget project completion? I conducted interviews with participants who experienced the manufacturing firm's successful ERP system implementation and used their answers to discuss the *what* and *how* interview questions. The findings revealed what the manufacturing firm did and how the firm achieved a successful ERP system implementation. The results also showed that the *what* and *how* answers identified ERP implementation strategies and mapped directly to the elements of the TOE conceptual framework.

According to Yin (2017), in a case study research, by relating literature, theories, and study results, a researcher alleviates personal bias. According to Simpson and Quigley (2016), a reflective journal mitigates the bias of a researcher during data collection and data analysis. I used a reflective journal to mitigate my bias. I linked the findings of the study to existing professional and academic literature and used the TOE theory as a lens to explore and analyze the primary and secondary data sources. The findings of this study conform to the principles presented in existing professional and academic literature concerning ERP system implementation.

As a researcher, I focused on the interview answers, impartial observations, self-reflection, professional and academic literature, and corporate documents to explore the strategies that the manufacturing firm used to implement their ERP system successfully.

The purposeful sample for this single-case study comprised five ERP implementation stakeholders. The stakeholders included (a) procurement manager, (b) storeroom manager, (c) warehouse manager, (d) head of IT, and (e) finance manager. Corporate documents obtained during data collection included (a) project goals presentation June 2013, (b) post go-live optimization presentation January 2014, and (c) re-order analysis report January – June 2017. I answered the overarching research question by using a qualitative method and single case study design because my interest was in collecting data based on the lived experiences of stakeholders of a manufacturing firm in Ghana. As noted by Denzin and Lincoln (2011), this method and design is a better predictor of human experience. I used open-ended questions and in-depth interviews with the goal of capturing *rich* and *thick* data as described by Yin (2017). I scheduled 30 minutes face-to-face interviews in a corporate conference room at the manufacturing firm.

Participants arrived at the conference room with copies of the consent form. I reviewed the consent form with each participant. My review reminded participants that I would audio record the interview and reiterated their option to withdraw from participation at any time. All five participants responded to each open-ended interview question. I concluded most interviews within the allotted time frame. However, one participant spent 30 minutes presenting a detailed analysis of the corporate implementation documents—goals presentation June 2013, post go-live optimization presentation January 2014—therefore the interview and detailed discussions lasted for 60 minutes. I interviewed all five participants during a 2-day period. For member checking,

each participant received an e-mail copy of a summary of the interview to confirm that the information was correct and complete.

I analyzed the corporate documents including (a) project goals presentation June 2013, (b) post go-live optimization presentation January 2014, and (c) Re-order analysis report January—June 2017 and derived secondary data. Participants from the storeroom and IT departments provided the corporate documents. Participants from the IT department provided the project goals presentation June 2013 and post go-live optimization presentation January 2014 documents and participants from the storeroom provide the re-order analysis report January—June 2017 document. I compared and analyzed the primary and secondary data until no new themes emerged. I used methodological triangulation by analyzing interview responses from IT, finance, procurement, storeroom, and warehouse and examining corporate documents. Resultantly, I achieved my goal of compiling themes and subthemes that answered the overarching research question: What strategies do stakeholders in manufacturing use to improve ERP implementations to ensure on time and on budget project completion? To ground this study with a theory, I analyzed the relationships between the TOE conceptual framework and the themes and subthemes. I generated two categories of themes: main and subthemes. Main themes, as posited by Cleary, Horsfall, and Hayter (2014), are the general category of information that most respondents provided and subthemes are codes that participants provided that relate to the main themes.

After collecting and analyzing the data from interviews, my journal, and three corporate documents including (a) project goals presentation June 2013, (b) post go-live

optimization presentation January 2014, and (c) re-order analysis report January—June 2017, 14 themes emerged. I divided the 14 themes into four main themes. The four main themes included (a) human and technical infrastructure resources (b) top management support, (d) change management, and (e) reasons for ERP system implementation. The first main theme related to human and technical infrastructure resources required to implement ERP projects successfully. The subthemes of this main theme included team composition and dedicated resources. The second main theme related to top management support and included subthemes of (a) commitment (b) consultant and vendor selection, and (c) consultant and vendor support. The third main theme related to change management had the most subthemes including (a) strategic plan, (b) communications, (c) education and training, (d) knowledge management, and (e) user involvement. Change management is a TOE organizational readiness element. As depicted in Table 1, change management had the most frequent occurrence. The many change management subthemes confirmed Garg and Garg's (2014) observation that most frequent 10 ERP strategies identify as TOE organizational context. The fourth and final theme related to the reasons business leaders of the manufacturing firm decided to implement an ERP system. The subthemes included (a) efficiency gains, (b) integrated system, (c) ERP system trends, and (d) return on investment (ROI).

Emergent Theme 1: Human and Technical Infrastructure Resources

The first main theme was human and technical infrastructure resources and had subthemes of team composition and dedicated resources. Concerning team composition subtheme, the manufacturing firm commissioned a project champions team consisting of

technical and functional resources. The project champions team members had the authority to lead their respective functional and technical areas on behalf of the project. The team composition consisted of resources from IT, finance, procurement, stores (spare parts and raw materials), warehouse (finished goods), logistics, and distribution. According to participants, the project champions team combined with the contractor and vendor teams to manage the project. The practice of combing the project champions team with the vendor and consultant into a single team confirmed Beheshti et al.'s (2014) statement that software vendors should collaborate on the implementation schedule and training and education activities. Participants P001, P002, P003, P004, and P005 regarded the role of the champions team as significant to the success of the ERP project. According to participant P001, the project champions team focused on the new SAP implementation while other department resources concentrated on the legacy Sage system. Participant P001 stated: "while we were working with the old system, our project champions were working with the new system."

When comparing the theme and its subthemes to the peer-reviewed studies, the themes confirmed existing strategies of ERP system implementations. In support of the use of a project champions team as a strategy for success, Hsu (2013) posited that by combining IT resources and organizational resources results in a competitive advantage. Concerning the subtheme of dedicated resources, employees who were not members of the project champions team took time to help other team members in understanding the new ERP. For instance, participant P005 mentioned that a non-champion staff from the production department provided dedicated assistance to the production staff. Participant

P005 stated: “in every department there were some people who were picked as the main focus of whatever we do.” Participate P005 also stated: “there [were] some key people in each department.”

Such individual and self-appointed champions contributed to the success of the production department. Similarly, when organizational leaders experienced a failed mock or fake implementation, the leaders recruited a manager with experience in SAP software, ERP implementation, and manufacturing to save the project. Participants did not mention human resource constraints. However, participant P001 noted that infrastructure resources such as server storage capacity and power connectivity issues required the IT department to purchase bigger servers and additional backup power supplies. Participant P001 stated: “IT department had to buy additional storage and backup power supply.” Participant P001 confirmed Ahmadi et al.’s (2015) argument that organizational leaders must provide adequate infrastructure support for the implementation of an ERP system. Similarly, the participant confirmed Wright’s (2016) assertion that dedicated resource includes the hardware needed for the usage of an ERP system. The participant’s experience with IT confirmed the literature findings regarding how infrastructure drives performance and supports the complexities of ERP implementation projects (Garg & Garg, 2014).

As viewed through the lens of the TOE theory, the theme, human and technical infrastructure resources and the subthemes of team composition and dedicated resources map to the context technical and organizational elements (Schniederjans & Yadav, 2013). Managing technical and functional resources and forming composite teams and

employing the right ERP manager represents the TOE organizational readiness elements. Managing storage and power management systems is significant to the success of an ERP. Therefore, the budgeting and acquisition of dedicated technical infrastructure resources represent the TOE technology element. Both TOE organizational and technology context elements improve the success of an ERP implementation (Kinuthia, 2015).

Emergent Theme 2: Top Management Support

The second main theme coded was top management support and had subthemes of (a) commitment, (b) consultant and vendor selection, and (c) consultant and vendor support. Concerning top management support and commitment, most participants remarked that top management directives and support came from the board of directors, IT director, and Finance director. Participants described top management's involvement as directors' mandate to implement the ERP solution. Participant P001 stated: "it was the boards directive that we go in for SAP." Participant P002 stated: "it was the board's approval." The participants noted that the directors backed their mandate with commitment. Participant P002 stated: "they were actively involved." According to Mullins (2013), employees comfortably embrace ideas when directed by upper echelon. Senior management commitment and support are CSF in every phase of the ERP system implementation. The participants confirmed Schaffer's (2016) argument that executive leadership contributes to a positive work environment that leads to users maximizing their involvement.

A participant, P003, recalled the finance director counseling the finance department about the inevitability of errors in any new system. This statement from the finance director reduced the anxiety and built confidence. Participant P003 stated: “this gave everybody the confidence that this can be implemented successfully.” Participant P001 reported that the role of the board of directors was “very important to the successful SAP implementation.” Both participants P002 and P005 attributed the success of the SAP implementation to the role of the IT director while participant P002 also credited the Finance directors’ involvement. A participant (P003) also noted that the roles of directors, in general, set the expectations early in the process for all stakeholders. Participant P003 stated: “management role was to set the expectations and they had meetings with all to make sure that everybody was on board.” Regarding top management support and commitment, both the alignment of manager and company goals and personal traits of an executive influences performance (Hermano & Martín-Cruz, 2016). However, participant P004 attributed the failed mock or trial Go-live effort to the lack of leadership from the finance director. Participant P004 stated: “the finance director who had an emotional attachment to Sage did not contribute enough to get SAP to work.”

Concerning the subtheme of consultant and vendor selection, participant P001 noted that the model used to select the vendor was not known because the company directors hand-picked the SAP vendor. Participant P001 stated: “the board directive” as the reason for selecting SAP. The participants confirmed Beheshti et al.’s (2014) argument that two-thirds of the time organizational leaders choose their ERP software

vendors. However, participant P001 noted that organizational leaders used a competitive bidding process to select the consultant. Organizational leaders instituted this formal process after the failed mock or trial Go-live attempt which resulted in the termination of the first consultant. The results of this study showed that organizational leaders did not use a competitive bidding process when recruiting the first consulting firm. However, organizational leaders selected the second consultant from a list of recommended consultants provided by the SAP software vendor coupled with a competitive bidding solicitation.

Concerning consultant and vendor selection, Garg and Garg (2014) revealed that consultant and vendor selection is a critical process in ERP implementation and requires a complex matrix of business strategies and a multiple criteria decision model. The findings of this study showed that before the execution of the mock or trial Go-live phase of the project, the organizational leaders had recruited an inexperienced consultant. Choosing an inexperienced consultant could lead to longer implementation time and budget overruns. Kilic et al. (2015) echo this sentiment by arguing that the consultant selection process is complicated, and a multi-criteria decision model is recommended to facilitate the decision-making process. According to participant P004, organizational leaders fixed this problem by terminating the first consulting firm. Participant P004 stated: “because of the risk of these guys we had to pick another consultant.” The termination of the first contractor because of product and industry inexperience confirmed Garg and Garg ‘s (2014) argument that organizational leader must select consultants with a solid understanding of the ERP software.

Concerning consultant and vendor support, all five participants noted the significance of the contributions of the consultants and vendor to the success of the project. The participants attributed the project achievements to the integration of the consultants and vendors with the project champions team into a single project team. Participant P001 stated: “the whole thing was driven by consultants through the champions.” Further, participant P002 stated: “they were on-site guiding us.” Most participants noted that the consultants and vendors provided education, training, and knowledge transfer during the pre- and post-implementation. Participant P001 stated: “IT department and consultants were engaged with the help desk.” Further, participant P003 stated: “consultant and vendors provided training both internal and external.” Regarding the subtheme of consultant and vendor support, the participants confirmed that consultant and vendor support is a CSF in the implementation of an ERP system. This is in line with the findings of Li et al. (2017) who stated that support provided by both consultants and vendors is a CSF in ERP implementation. According to Yeh and Walter (2016), vendor support in the pre- and post-implementation phases generates collaboration between the project team and leads to on time and on budget ERP implementation. However, Almahamid and Awsi (2015) disconfirmed top management support as a significant factor but confirmed vendor support as substantial to the implementation of ERP systems.

As viewed through the lens of the TOE theory, the top management support theme and related subthemes align with the elements of the TOE organizational and environmental context (Schniederjans & Yadav, 2013). Most participants referenced the significance of top management support. This recognition means that top management

support maps to the TOE organizational readiness element. Conversely, consultant and vendor selection and consultant and vendor support map directly to the TOE environmental elements. Most participants noted the significance of both consultant and vendor selection and support to the success of the ERP, confirming that organizational leaders need both the TOE organizational and environmental elements to improve ERP implementation projects.

Emergent Theme 3: Change Management

The third main theme coded related to change management and had subthemes of (a) strategic plan, (b) communications, (c) education and training, (d) knowledge management, and (e) user involvement. Altamony et al. (2016) identified change management as a CSF and one of the most difficult challenges to successful ERP system implementation. Concerning the subtheme of strategic planning, a participant mentioned tactical planning as a strategy for implementing the ERP at the manufacturing firm. Peer-reviewed literature revealed that strategic plans help ERP implementation practitioners focus on internal factors (Reimer et al., 2016). The participant shared documents that outlined (a) project management methodology (b) mock or trial Go-live plan, (c) actual system Go-live plan, and (d) post-Go-live optimization plan.

Regarding project management methodology, participant P004 reported that the manufacturing firm used SAP's implementation methodology. Participant P004 stated: "we used SAP's recommended methodology". A review of the corporate documents showed that the SAP system implementation methodology included the

following phrases: (a) project preparation; (b) business blueprint - representing analysis; (c) project realization - representing design, build and test; (d) final preparation; (e) production Go-live; and (f) post-Go-live support. The findings of this study coincided with the research by Garg and Garg (2014) and Yeh and Walter (2016) asserting that project management is a CSF in the implementation of ERP systems.

According to participant P004, even with a tactical plan, the mock or trial Go-live implementation failed because of incomplete configuration and the lack of specific industry and software product implementation experience of the first consulting firm. Participant P004 stated: “we attempted a Go-live and we failed.” The Go-live strategy, according to the participant, was to keep both the legacy and new SAP system in production mode with only open balances of all legacy transactions added to the new SAP. Concerning the production Go-live, participant P004 noted that the tactical plan was not to implement a big-bang but instead a phased approach, as posited by Garg and Garg (2014), with important modules implemented first and the rest implemented during the post-Go-live optimization phase.

The organizational leaders planned the optimization phase for a duration of 1-year after Go-live. Participant P004 recalled the strategy was to implement critical modules to allow the business to perform its essential business such as buy raw material, store material, produce finished goods and sell the products followed by other modules during the post-Go-live optimization phase. Participant P004 stated: “we went live with challenges so we rolled out another project called optimization.” Based on the organization documents provided, the optimization phase tasks included

identifying and fixing gaps for each business area to involve configuring controls and validations, updating role definitions, business reporting, data quality and integrity, and infrastructure and disaster recovery plan, and documentation.

According to participant P004, the production Go-live plan had significant flaws. Finance, inventory, and sales employees had to enter open balances of their business transactions into the new SAP system manually and tediously while keeping the transaction details in the legacy. Participant P004 stated that the experience was "madness and stressful" for all end-users. Participant P003 stated: I was stressed but could not run away from it." Other participants noted that another flaw was because of the availability of the legacy system. The availability of the legacy Sage system increased the resistance of users to use SAP. Other participants also noted that having two production environments made it difficult for the storeroom staff to reconcile open balances in Sage and SAP and made it difficult for the finance team to catch-up with backlogged vouchers.

Concerning the change management subtheme of communications, participants reported that organizational leaders made employees aware of the project months ahead of the implementation via various change management activities including digital media activities and a town hall event. Participant P001 stated: "our change management was a major change effort." The participants credited the manufacturing firm for a comprehensive digital media program and an enterprise-wide town hall event. Participant P001 stated: "we had a big durban with all the employees." Further, participant P003 stated: "We had a seminar and everything was explained to us."

Furthermore, participants P001 noted that digital media promotions included videos and desktop screen saver displayed messages regarding SAP functional and technical how-to information. According to participant P001, other promotional items included T-shirts, hats, and wall posters. Most participants referenced these early awareness programs as a contributing factor to the success of the SAP implementation. The participants confirmed Reimer et al.'s (2016) research on managers and management control systems in the strategy process, emphasized that communication is a CSF in the implementation of ERP systems. Likewise, Bloom et al., 2014, argued that the success of an organization directly relates to its communication programs.

Concerning the education and training subtheme, participant P001 noted that the training rotation scheme was beneficial to the project teams. According to the participant, this scheme meant that various departments rotated their employees through the training classes which provided employees the opportunity to learn the new SAP system with minimum adverse effect on their day-to-day tasks. Participant P001 stated: "training was done in phases so that I could go and next month someone [else] in my department will go." The participant confirmed Wright 's (2016) statement that a variety of training programs are essential to the successful implementation of an ERP. Regarding the training rotation scheme, the participant confirmed Esteves's (2014) study on identification and categorizing training best practices for ERP implementation. Esteves argued that reorganizing training sessions to focus on teams is the recommended best practice.

All five participants noted that training was an integral part of the project and that sessions occurred before, during implementation and continued after Go-live and still on-going. Participants P002, P003, and P005 noted that the vendor provided training offsite and included classroom-based courses and seminars. The participants confirmed Sykes's (2015) suggestions that organizational leaders must engage ERP consultants to train and educate and must provide training at implementation and post-implementation stages of the project. However, participant P004 noted that the project champions team members first received training and the champions, in turn, taught employees. Participants P003 and P005 mentioned that employees received instructions both in internal and external settings.

Concerning the change management subtheme of knowledge management, participant P003 noted that a project help desk was established to address concerns and questions from users. Consultants managed the help desk and supported by the project champions. Participant P003 stated: "the vendor and IT department managed the help desk." The participant confirmed Jayawickrama et al.'s (2016) suggestion that to manage knowledge efficiently requires experienced system integrators. The participant P003 also stated: "we still use the help desk to this day." and reported that users could reach the help desk via email and phone and that this knowledge management tool and knowledge transfer provided by the consultants contributed to the success of the SAP implementation. The participant confirmed Yeh and Walter 's (2016) suggestion that knowledge transfer includes consultant and Jeng and Dunk's (2013) conclusion that the creation of knowledge leads to ERP implementation project success.

Concerning the change management subtheme of user involvement, participants noted that end-users' involvement started early in the project. Participant P003 stated: "I was involved early in the process and it gave me the opportunity to know what to expect." Further, participant P001 stated: "some were left out initially but later we added additional people so that everybody was involved." These observations confirmed the results of a study by Schaffer (2016) regarding strategies ERP directors use to maximize usage of an ERP system. Schaffer concluded that early user participation is the most significant strategy to increase the usage of the ERP system. However, participants repeatedly shared memories of users' resistance to the new system as the most difficult barriers to overcome. Participant P001 stated: "You know our Ghanaian culture with respect to change; we had a lot of people who grumbled a lot, we had a lot of resistance." Further, participant P004 stated: "I say Africa people most of the time like to resist." These assertions confirmed the peer-reviewed literature regarding inadequate change management as the cause of ERP failure at Hersey (Dwivedi et al., 2014). The participants statements confirmed Altamony et al.'s (2016) view on the challenges of change management and organization culture.

A participant (P004) noted that the new system controls needed to perform their duties caused stressed for end-user. For instance, before the new SAP system end-users would write a memo to finance for cash to buy raw material for production. Participant P004 stated: "everything was done through memo." With the new system, production staff was required to create a purchase requisition in SAP. Participant P004 gave an

example of bypassing workflow controls. The participate stated that when a production staff bypassed the first step of creating a purchase requisition in SAP, the result was an invalid manufactured product and therefore could not be sold. Participant P004 stated: "the whole workflow is outside of the business." The participant reported resistance to the new system as stressful. Participant P004 stated: "very, very stressful so bad for me because with my experience, in all SAP implementations, you don't mess with data; data will kill you." A culture of system ownership compounded the user resistance problem. According to participant P004 the production staff had a habit of asking the finance department to enter their information into Sage. The production staff's perception was that Sage belonged to the finance department. Participant P004 stated: "our major challenge was getting our production people to not wait for finance to do a requisition." Introducing a new system that required the production staff to learn and use business process workflows was a shock to the production staff. Several participants emphasized the challenge as changing mindsets and argued that for the successful adoption of a new system, business leaders should first change the cultural mentality. For example, participant P001 stated: "people wanted to pay for service but did not want to go into SAP." Further, participant P004 stated: The problem we had was that we had people whose mindset is produce, produce, produce; to them system doesn't mean anything." Furthermore, participant P004 stated: "if you talk to them they will tell you this is how we do it." The participants recollection supported the peer-reviewed literature by Rahman et al. (2014). Rahman noted that subjective norm

influences the decision to use innovative technology based on perceived behavior, usefulness, and ease of use.

Regardless of these challenges, most participants noted that organizational leaders managed user resistance successfully. Participant P001 stated: “our resistance problems were fixed by top management.” The participants mentioned that top management handling of perceived ease of use and perceived usefulness contributed to the success of the SAP implementation. For example, organizational leaders bought laptops and mobile devices that allowed end-users to manage business process workflows from remote locations. According to a participant, this effort alleviated perceptions regarding usefulness and ease of use. The participant’s statements supported Mayeh et al.’s (2016) conclusion that perceived ease of use of an ERP system has a positive effect on the end users’ intent to use a newly adopted ERP system. Organizational leaders also instituted daily production meetings on the floor of the factory with representatives from all departments.

As viewed from the perspective of the TOE theory, the theme of change management and subthemes of (a) strategic plan, (b) communications, (c) education and training, (d) knowledge management, and (e) user involvement align with the TOE organizational context. Strategic planning, communications, user involvement, are TOE organizational readiness element because they require technical and functional resources (Mamoghli et al., 2015). Similarly, knowledge management attributes such as help desk and transfer of knowledge from consultants and project champions to employees also map to organizational readiness. The inspiration and acquired

knowledge from education and training programs and efficient communications constitute TOE organizational best practice element (Esteves, 2013). Most participants noted the significance of the subthemes to the success of the ERP. The alignment of the subthemes to the TOE theory confirms organizational readiness and best practice as elements needed to improve ERP implementation projects.

Emergent Theme 4: Reasons for ERP System Implementation

The fourth and final theme related to the reasons the manufacturing firm decided to implement an ERP system and consisted of the subthemes (a) efficiency gains, (b) integrated system, (c) return on investment, and (d) ERP system trends. Concerning the subtheme of efficiency gains, several participants mentioned efficiency gains as the motivational factor for implementing the new SAP system at the manufacturing firm. Participant P001 stated: “we needed a world class software that was more robust.” Further, Participant P002 stated: “we were doing things manually and our inventory was growing so we needed SAP.” Furthermore, participant P001 noted that the organizational leaders were interested in procurement efficiency through SAP automation and the ability to be able to measure efficiencies. Participant P002 also reported that the reasons for implementing the new SAP software included efficiency gains in analyzing monthly material consumption and calculating average usage and lead times for the storeroom. Another participant (P003) reported that the primary reason was the capability to fully automate the entire supply chain from raw material to distribution on time. Participant P003 listed the flow of manufacturing as production to quality control to the warehouse to sales then to accounting. Participant P003 stated:

"now our way of production is from manufacturing to warehouse to sales systems and off the factory [floor]." Participant P003 also noted that organizational leaders targeted a fully automated paperless end to end system.

A participant (P002) mentioned that the organizational leaders realized the growth of inventory as one of the reasons for a more robust ERP. Participant P002 state: "with the new SAP system, stock availability, balances, stock and restock levels functionality became readily available." Further, participant P003 stated: "the benefits of the ERP implementation included openness and accountability." Furthermore, participant P003 noted that the new system allowed the tracking of a request from the warehouse for direct raw material to delivery to the warehouse. However, participant P003 stated: "part of the business processes such as requesting indirect materials remains a manual process."

The views of the participants supported the argument that internal efficiencies from integrated workflows confirmed AlQashami and Mohammad's (2015) suggestion that HEI business derived process improvement and internal efficiency gains from their ERP system. The participants confirmed the peer-reviewed literature by Ram et al. (2014) that supports the argument that ERP benefits gained from efficiency include better cost management and faster time-to-market. Likewise, López and Salmeron (2014) echoed the sentiment by referencing efficiency gains from ERP systems.

Concerning the subtheme of integrated systems, some participants described the changes in software from a home-grown Tally system to Sage and then to SAP. The participants noted that SAP was implementation for the benefits of a fully integrated

system. Participant P001 stated: “it gave us a single platform view.” Similarly, participant P004 stated: “this is a single integrated solution.” The view of the participants supported Arthur ‘s (2016) suggestion that to gain efficiencies organizational leaders must integrate their SCM and CRM with their ERP. The organizational leaders provided documentation that outlined the goals of the project that included terms such as *single integrated solution* and *complete integration.* Examining professional and academic literature revealed that ERP systems consist of reliable integrated information (Bhattacharyya & Dan, 2014). Conversely, Beheshti et al. (2014) noted that universal view of information across the organization improves decision making. Further, Ajit et al. (2014) posited that ERP systems consist of a comprehensive view of data that supports all departments in an organization.

Concerning the subtheme of return on investment, participant P001 reported that organizational leaders were interested in the return on investment from the project through efficiency gains. Participant P001 stated: “we streamlined the whole process for a return on investment. For example, the use of standard industry practices could result in improved efficiencies (Parthasarathy & Sharma, 2016). Participant P001 confirmed Egdair et al. (2015) and Fadlalla and Amani ‘s (2015) study pertinent to return on investment, that stated that organizational leaders use ERP systems to improve the overall performance and return on investment. However, the goals for the project as outlined in the corporate documents excluded return on investment instead included (a) standardize applications, (b) removal of reductant and manual process, (c) accurate supply chain forecasting, and (d) standardize financial reports. Miller (2017) extended

the reasons for ERP implementation to include governance and structure of business processes. Though, the participants did not mention governance and structure as motivations for implementing the ERP system at the manufacturing firm, the corporate documents included terminology such as standardization of applications and reports and accurate forecasting both of which imply governance and structure of business processes.

Concerning the subtheme of ERP system trend, an ERP system trend is one of the reasons for implementing the SAP system at the manufacturing firm. Participants P001, P002, P003, P004, and P005 mentioned current and prior ERP software systems used at the manufacturing firm including Tally and Sage. The participants also noted that organizational leaders researched potential replaces including ERP competitors such as Oracle, Microsoft, and SAP. These testimonies supported an observation, from a study by Tobie et al. (2016) regarding ERP implementation within African countries, that SAP, Oracle, and Microsoft appeared to dominate the SME market. Participant P001 stated: “due to the limitation of the legacy Sage platform, we needed an application that would better handle an inventory database that was growing exponentially.” However, participant P004 argued that the current ERP software version was less robust because of the circumstances under which the software company acquired and rebranded the product.

As viewed through the lens of the TOE theory, the subthemes (a) efficiency gains, (b) integrated system, and (c) ERP system directly map to the TOE technology context. Efficiency maps to the technology competencies element. Awa and Ojiabo,

(2016) studied TOE conceptual framework and noted that ERP system leaders improve operational efficiency for an organization and their integrated external partners. ERP system leaders use efficiency to execute business processes with ease and leaders whose organizations have a higher level of operational efficiencies are more likely to use their ERP system. Likewise, Ruivo et al. (2014) indicated that the technology elements of a small business in Portugal included efficiency. The findings of this study showed that ERP trends and integration as reasons for implementing ERP at the manufacturing firm. These subthemes mapped to the TOE technology elements of relative advantage and technology infrastructure respectively (Yoon & George, 2013) and confirmed that TOE technology elements improve ERP implementation projects.

Applications to Professional Practice

ERP system benefits include improvements in organizational (a) expenditure, (b) production, (c) cycle time, and (d) efficiency as well as gains from cost management and product quality (López & Salmeron, 2014; Ram et al., 2014). Ultimately, organizational leaders use their ERP systems to (a) reduce operating expenses, (b) increase sales, and (c) meet their business goals. Despite the benefits of ERP systems, many ERP implementation projects fail (Garg & Garg 2014). The findings of this study contained multiple strategies of ERP system implementation at a manufacturing firm in Ghana. Business leaders and managers seeking successful ERP system implementations can leverage the strategies provided in this study to implement ERP software to achieve on time and on budget project completion.

Stakeholders within manufacturing and other industries could use the four themes and related subthemes of this single-case study to improve ERP software implementation projects. The themes and subthemes align with the critical factors and TOE elements provided in the professional and academic literature section of this document. This single-case study explored the experiences of stakeholders at a manufacturing firm who had successfully implemented an ERP system. Therefore, stakeholders could use the identified strategies to contribute to a successful ERP implementation. The findings of this study are relevant because the stakeholders of the manufacturing firm recognized the significance of (a) human and technical infrastructure resources, (b) top management support, (c) change management, and (d) reasons for ERP system implementation.

For instance, based on the study findings, stakeholders used human and infrastructure resource as a strategy to plan the implementation. Also, participants confirmed that providing adequate and consistent top management support and communications were strategies used during the ERP system implementation at the manufacturing firm. Top management support is one of the frequently cited strategies for empowering employees to implement ERP software successfully. Participants also confirmed that change management was another strategic enabler that organizational leaders used to learn about the implementation and manage organizational culture. This qualitative study is useful for stakeholders to understand that the deployment of effective communications is a governance vehicle for ensuring a common understanding among project teams. Ultimately, the motivating factors such (a) efficiency gains, (b) integrated system, (c) return on investment, and (d) ERP system trends served as beneficiary factors

that encourages leadership and subordinate stakeholders to embark on the ERP implementation project. Business leaders and stakeholders could leverage these strategies to future enterprise-wise system implementations as well as future ERP upgrade efforts.

The findings of this study afford organizational leaders with knowledge of the successful implementations and contributes to the general understanding of ERP implementation strategies. Therefore, themes and subthemes could apply to all industries worldwide. The study results are comprehensive and should make leaders less fearful of the challenge of implementing an ERP project. Consequently, leaders could use the newly acquired knowledge to boldly integrate technical, organizational, and environmental factors to achieve organizational efficiencies.

To the best of my knowledge, this study is the first ERP strategies study in Ghana and the first ERP study of a manufacturing firm in Africa. I expect the study to fill this void for professional practitioners in Ghana and Africa in general. I anticipate this study will specifically benefit manufacturing firms in Ghana because I explored and answered the overarching research question of strategies that manufacturing firms in Ghana used to implement an ERP system successfully. In addition, the results of this study provide ERP system implementation strategies that could provide information to help ensure on time and on budget project completion that would allow organizations to allocate additional financial resources to corporate social responsibility efforts.

Implications for Social Change

The fear of ERP implementation failure among business leaders is real. According to Kharuddin, Foong, and Senik (2015), the fear of failure leads to fewer ERP systems

adoptions and some organizational leaders even think that ERP implementations have a negative effect on their organization (Yaghubi & Modiri, 2014). However, other organizational leaders could use the results of an ERP study to influence social change using implementation strategies that conform to the elements of the TOE conceptual framework. Organizational leaders could use the results of this study to (a) increase internal and external collaboration between supply chain users, (b) increase the quality of goods to the community, and (c) improve return on investment for shareholders. Resultantly, the improvements and efficiencies could lead to profitability that would allow the organization to fund corporate social responsibility project.

Based on the study findings, with an understanding of the strategies for implementing ERP systems, organizational leaders made timely decisions such as instituting daily production meeting to improve user resistance to production system controls. Organizational leaders also improved intra-organization relationships and developed a positive attitude toward each through the formation of a project champions team and integration of the vendor and consulting firm into a single ERP implementation team. These social benefits lead to the emergence of a social network (Sykes et al., 2014). Participants agreed that the development of a social network was a CSF in the ERP implementation.

Recommendations for Action

The purpose of this single-case study was to explore the research question: What strategies do stakeholders in manufacturing use to improve ERP implementations to ensure on time and on budget project completion? Four main themes emerged

comprising of (a) human and technical infrastructure resources, (b) top management support, (c) change management, and (d) reasons for ERP system implementation to achieve a successful ERP system implementation. I analyzed the data and generated four categories of commendations. By conducting face-to-face interviews, I asked the participants questions and followed-up with additional questions. I had detailed discussions regarding the themes and subthemes as presented in this study. Based on the discussions and the analyzed data, I provide recommendations related to four themes. Findings and recommendations from this study may be useful to businesses and organizational leaders who plan to implement a new ERP system or upgrade an existing ERP system. Regarding the theme of human and technical infrastructure resources, a participant noted that organizational leaders hired an experienced ERP manager after the failed mock or trial Go-live. Organizational leaders should plan to recruit an experienced program or project manager who has managed an implementation of the same or similar ERP software within the same industry. Likewise, I recommend that organizational leaders plan for the potential growth of infrastructure resources such as storage and servers. All five participants noted that project champions team was significant to the implementation. I recommend that organizational leaders form a single diverse team with representatives from each department within the organization. This team would represent the organization and work closely with the vendor and consulting firm.

All five participants recalled the significance of support from top management. Organizational leaders – board of directors and other directors - should provide their

fullest commitment to the project and tactically oversee the selection of vendors and consultant. The findings of this study suggested organizational leaders did not use a competitive bidding process to select the first consultant. Organizational leaders must accurately vet all vendors and consultants. Based on the findings of this study, in the developing economies context, board of directors or leaders could hand-pick the ERP software vendor without competitive bidding. However, regarding selecting a consulting firm, organizational leaders should seek a shortlist from the ERP software vendor and use a competitive bidding process. I also recommend that organizational leaders choose a consulting firm with the capabilities to convert legacy data to the new system. This skillset will relieve employees of the arduous tasks of manual data entry of legacy transactions.

Regarding change management and anticipating and managing perceived usefulness, perceived ease of use, and organization culture, I recommend that organizational leaders, particularly in the developing economies, pay attention to organizational culture. The most consistent barrier mentioned by the participants was the difficulties of the production staff assimilating to the new ERP system. As evident from the organization culture challenges, awareness and training alone are not sufficient. Therefore, I recommend that organizational leaders anticipate and manage (a) technology literacy, (b) adaptability to business process controls, and (c) a culture of manual manufacturing. To this effect, I also recommend that organizational leaders provide hands-on workshops to enable production staff to experience the full life cycle creation of a consumer product using the workflow of the new system before Go-live.

Organizational leaders must also quantify the results of such workshops to manage resistance by engaging an external consulting firm that specializes in change management. The change management consulting firms could measure the effectiveness of the workshops and serve as better organizational culture change agents than employees.

I will share this study with business and academic institutions. Disseminating findings from this study to businesses and educational institutions via academic journals, trade journals, professional conferences, and magazines could extend the potential benefits from this study. Through these channels, I will share the study findings with (a) ERP system professionals, (b) ERP system vendors and consultants, (c) manufacturing firms, and (d) ERP academic researchers.

Recommendations for Further Research

As outlined in this study, many strategies contribute to the success of implementing an ERP system. In this study, I explored some of these factors including (a) human and technical infrastructure resources, (b) top management support, (c) change management activities, and (d) reasons for ERP system implementation to achieve a successful ERP system implementation. The findings of this study indicated further exploration of strategies that stakeholders used to implement ERP projects on-time and on budget. Consequently, my recommendations for new research include (a) mitigating the limitations noted in Section 1; (b) studying ERP implementation methodologies; (c) exploring factors beyond CSFs.

Concerning mitigating the limitations noted in Section 1, to the best of my knowledge, this study is the first of its kind. This accolade notwithstanding, I recommend a multi-case study of the strategies manufacturing firms in Ghana use to improve ERP implementations to ensure on time and on budget project completion. By employing a larger sample size, the researcher could mitigate the limitations of transferability. In addition, according to Shatat and Dana (2016), single-case studies have limited generalization; therefore, I would recommend that the researcher also interviews all stakeholders to enhance generalization.

Concerning studying ERP implementation methodologies, Alturkistani, Shehab, Cranfield, and Al-Ashaab (2015) recommended a framework that would improve the ubiquitous ERP failure rates. Alturkistani et al. (2015), proposed a Lean-based framework for ERP implementation to address the pervasive failure rates. Similarly, Misita, Lapcevic, Tadic, Milanovic, and Borota-Tisma (2016) proposed a model for ERP implementation for manufacturing firms using analytic hierarchy process method to generate the relative importance of a specific technological, organizational or environmental risk source. Other ERP system implementation models should be studied to determine their viability to ERP implementation in academic and professional practices. Concerning exploring factors beyond CSFs, according to Misita et al. (2016), many of the ERP implementation studies focus on the CSF. In addition, according to Abdelmoniem (2016), interest in studies of how failing projects could recover has increased. Consequently, I recommend that future researchers focus their studies on critical failure factors and recovery.

Reflections

My interest in pursuing this research topic grew from my experiences in several industries. I have implemented several ERP software for different industries. Therefore, ERP implementation was a natural fit for me. However, narrowing the specific industry was challenging. Initially, I wanted to explore ERP strategies used by my employer – a US electric and gas utility company. However, I could not use my employer due to potential conflicts of interest. I then explored options in higher education because of my prior experience implementing an ERP for the U.S. Department of Education. I finally settled on a manufacturing industry in Ghana because, to the best of my knowledge, no research exists regarding ERP software implementing in Ghana and the country has a maturing manufacturing industry.

During the data collection and data analysis phases, I noticed differences and similarities with participants' personal experiences concerning ERP system implementation. Before collecting data, I was aware of and expected specific ERP strategies to be part of my discovery. I predetermined that the role of top management would be a significant strategy based on my experience of implementing ERP solutions at multiple organizations. The participants confirmed this strategy during the interviewing. However, I did not expect that managing organizational culture, because of user resistance, would be a critical ERP strategy. I now understand the significance of the challenge given the anxiety of users in a developing economy with less experience with technology who have the know-how of manufacturing consumer products successfully without the benefits

of technology. The ability to overcome this significant challenge is a testament to the commitment of top management.

Based on the findings from this study, I now understand the ERP strategies and barriers of ERP implementation from the perspective of a manufacturing warehouse manager, procurement manager, finance manager, and head of IT. I acknowledged my biases and minimized them throughout the interview process. Finally, completing this study has allowed me to contribute to the manufacturing industry in general and Ghana in particular; regarding ERP system implementation. I have gained an understanding of the alignment of ERP strategies in the manufacturing space to the TOE conceptual framework.

Conclusion

Researchers estimate that over 80% of Fortune 500 firms have implemented an ERP system (Maas et al., 2014). Implementing ERP systems is a capital-intensive and highly complex project; and if not executed correctly, could lead a company to bankruptcy (Fadlalla & Amani, 2015). Despite these challenges, organizational leaders continue to implement ERP systems because a successfully implemented ERP system can result in enhanced productivity through integration, and standardization of business processes (Ram et al., 2014). ERP leaders need an understanding of how to improve their ERP systems.

The findings of this study concluded that organizational leaders pursuing an ERP system implementation must consider (a) human and technical infrastructure resources, (b) top management support, (c) change management, and (d) reasons for ERP system implementation to achieve a successful ERP system implementation. Reviewing the

findings of this study showed that stakeholders – users, managers, and leaders – need to fully understand the technical, organizational, and external complexities of implementing an ERP system. Success in ERP system implementation results from the understanding and effective management of the elements that constitute the TOE theory.

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Appendix A: Interview Protocol

The purpose of this interview is to answer the research question on successful strategies that some stakeholders of manufacturing firms use to improve ERP implementations to ensure on time and on budget project completion.

I will complete the following steps during each interview.

1. The interview will begin with a brief overview of the research, the purpose, and the time required for the interview.
2. I will thank the participant for agreeing to participate in the interview.
3. I will present a copy of the informed consent form and review the contents of the form with the participant. The items included in the consent form are: (a) the expected length of time to participate in the interview; (b) the interview will be audio recorded and if a participant chooses not to be recorded, handwritten notes will be taken; and (c) a summary of the interview will be presented to each participant to validate my interpretations of their responses to each interview question.
4. I will explain that their participation is voluntary, and they can withdraw from the study at any time without prior notice and through a verbal or email request, even after the completion of data collection.
5. I will provide my contact information to each participant in case he or she decides to withdraw from the study.
6. I will obtain the participant's signature on the consent form as an indication of their agreement to participate in the study.

7. I will collect the signed consent form and provide the participant with a copy of the consent form for his or her records.
8. I will use a sequential coding system to identify the participants during the interview recording without using their names. For example, I will assign each participant an identifying pseudonym, such as P1, P2, and P3. I will explain that I will be the only person with access to the name of each participant associated with each pseudonym and that data from their interview will be identified in my database using only their assigned pseudonym.
9. I will record the interview, if permitted, after a participant signs a consent form and begin with open-ended questions, which may include probing questions to expand on the participant's responses.
10. At the end of the question period, I will remind the participant that I will provide him or her with a summary of the interview and my interpretations of their responses to review and validate.
11. Request documents that I have been granted permission for the participant to provide copies of documents related to the successful ERP implementation such as strategy documents, lessons learned documents, project plans, internal memos, and change management deliverables. This has been approved by the authorized representative of the company in the letter of cooperation.

I will end the interview and thank the participant for taking the time to participate.