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Enterprise Resource Planning Implementation in Higher Education: Cost Containment Strategies

Tysha K. Tolefree
Walden University

Walden University

College of Management and Technology

This is to certify that the doctoral study by

Tysha K. Tolefree

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Review Committee
Dr. Matthew Knight, Committee Chairperson, Doctor of Business Administration Faculty

Dr. Olivia Herriford, Committee Member, Doctor of Business Administration Faculty

Dr. Ify Diala, University Reviewer, Doctor of Business Administration Faculty

Chief Academic Officer and Provost
Sue Subocz, Ph.D.

Walden University
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MBA, Troy University, 2004

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Doctoral Study Submitted in Partial Fulfillment

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Abstract

Lack of effective cost containment strategies to support enterprise resource planning (ERP) system implementations within higher education institutions (HEIs) result in budget overruns 50% of the time. Grounded in Gartner's IT cost containment techniques, the purpose of this qualitative multiple case study was to explore strategies HEI project directors use to support a successful ERP implementation on time and within budget. The participants comprised 5 project directors and managers from HEIs and another public organization in the state of Washington. Data were collected from semistructured interviews, archival data, and organization documents. Thematic analysis was used to analyze the data, and 4 themes emerged: project governance and project management office, resource allocation, vendor negotiation, and organizational change management. A key finding is the importance of including the project director in the vendor contract negotiations; thus, projector directors should be involved in the vendor contract negotiations. The implications for positive social change include the potential for improved student access to educational services and improved capacity for knowledge integration and transfer to benefit local communities.

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Dedication

To whom much is given, much will be required (Luke 12:48). I dedicate this doctoral study to my husband, Mark, my love and friend of nearly 25 long years. Pursuing a doctorate in business has been an amazing journey of ups and downs. There have been sleepless nights, the birth of our third child, your retirement, two career transitions for me, and a move across continents. We did it. This accomplishment would not hold the same depth of meaning without you by my side. I love you now and always. Thank you for giving me the best of you in our three beautiful, vastly unique children. Tionna, MJ, and Myles, remember that your light within you is bright and do not ever allow anyone to dim it. You can accomplish all things through Christ who strengthens you (Philippians 4:13). Your dad and I are your biggest fans!

I want to honor my mother Priscilla Austin-Boone who has always demonstrated what it means to be self-less, hardworking, and compassionate even when it hurts. The best part of me is because of you. I am deeply grateful to have my father, George Austin Jr., in my life as I have learned to navigate the uncertainties of life, face challenges without fear, and develop an affirmative appreciation for the skin I am in. You will never know how much I have truly learned from you. I paid attention. Thank you.

To my sisters and brothers, extended family, and closest sister-friend of over 25 years, nothing is greater than the love and compassion that family provides unconditionally. Thank you for allowing me to exist in a space of grace as my attempts to balance the time needed for my study and to participate in life around me were not always successful. I am grateful for many things… but the greatest of all things is love.

Acknowledgments

It is with sincere gratitude that I boldly express my appreciation and acknowledgment of my chair, Dr. Matthew Knight. I am thankful for the candid and enlightening discussions, for the continual encouragement, and the reassurance that this day would soon come. Dr. Olivia Herriford, otherwise known as Dr. O, is a positive force to be reckoned with in and out of the classroom. I was extremely fortunate to have her insight and guidance as my second committee member. Dr. Ify Diala, as my URR, thank you for ensuring quality and rigor as your thoughtful questions often required me to dig deeper.

There is no doubt about the camaraderie of fellow scholars and positive impact made in terms of support and encouragement throughout my doctoral experience here at Walden. Of particular note is Dr. Golden Mahove. From our second residency, through oral defense practice sessions, and ultimately a shared commitment to encourage one another to see this journey through to doctoral completion, you have been a steady confidant. Thank you!

Shirley Chisholm said, “Service is the rent we pay for the privilege of living on this earth.” Like Ms. Chisholm exemplified, I understand what it means to serve. I have also been blessed and highly favored to have strong role models, mentors, faculty, and community leaders to give of their time, wisdom, and resources to ensure that I stayed focused on what truly matters—education and serving others. Now more than ever, I have an even deeper understanding of my obligation to continue to pay forward what has been instilled in me, and I intend to do so. Lesson learned.

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Section 1: Foundation of the Study

Although organizations have differing definitions of project success, implementation costs are high and the rate for project failure continues to increase. In enterprise resource planning (ERP) implementations, decision makers tend to underestimate the time for project completion and costs, yet overestimate the scope (Seo, 2013). Projects with single ERP package implementations do not end as scheduled 59% of the time and are overbudget 74% of the time (Panorama Consulting, 2017). This is a significant increase from a study conducted by Mabert, Soni, and Venkataramanan (2003), where the project duration overruns and cost overruns were 41% and 39%, respectively. In this study, I explored cost containment strategies that project directors use to support successful ERP implementations.

Background of the Problem

Opinions differ on whether an ERP system implementation within a higher education institution (HEI) is possible without significant and costly customizations (Koch, & Mitteregger, 2016; Seo, 2013). However, information technology (IT) investments have proven to deliver both intangible and tangible values as HEIs continue to invest a considerable amount of money toward leveraging IT to improve student services and gain operational efficiencies (Grajek, 2018; Johansson, Karlsson, Laine, & Wiksell, 2016). Exploration of cost containment strategies used by project directors to mitigate budget overruns in ERP implementations within HEIs was the goal of this study. This area of study is relevant and reflects a gap in research literature. The focus of most researchers are the conditions that increase the probability of success and the

phenomenon of user acceptance (Lech, 2016). Exploration of proven cost containment strategies that HEI project directors can use to support successful ERP implementations may assist HEI leaders in their pursuit to maximize IT investments for all stakeholders involved.

Problem Statement

HEI collective investment in ERP systems has exceeded $5 billion through 2016 and continues to expand at a rapid pace (Ahmad et al., 2016). Although HEIs expect to achieve positive impacts and outcomes from ERP systems, 50% of ERP system implementations within HEIs are over budget (Abugabah, Sanzongni, & Alfarraj, 2015; Althonayan & Althonayan, 2017). The general business problem is some leaders of HEIs fail to implement cost containment strategies, which leads to budget overruns, and impacts the ability to deliver a successful ERP implementation project. The specific business problem is that some HEI project directors lack cost containment strategies to support a successful ERP implementation.

Purpose Statement

The purpose of this qualitative multiple case study was to explore strategies that HEI project directors have used to contain costs to support a successful ERP implementation. The targeted population included HEI project directors and managers located in the state of Washington who have implemented cost containment strategies to support a successful ERP implementation. Through semistructured, face-to-face interviews and publicly available archived reports and organizational documents, I identified and explored cost containment strategies project directors and managers have

used to support successful ERP implementations in HEIs and other organizations. The implications for positive social change are that the results of this study may contribute to improved student access to educational services, greater stakeholder alignment of shared goals, and an improved capacity for knowledge integration and transfer to potentially benefit the broader community.

Nature of the Study

I used a qualitative method for this study. Qualitative methodology involves research from an interpretive paradigm, which is subjective in nature (Tubey, Rotich, & Bengat, 2015). Specifically, qualitative methodology is about exploring knowledge in terms of meaning, comprehension, and the processes of how individuals interpret their experience (Merriam & Tisdell, 2015). As themes and patterns develop through the data collection process, an additional goal is to obtain a rich understanding of the research topic (Castleberry & Nolen, 2018). A quantitative method approach involves the application of statistical procedures to analyze relationships among variables (Arthur, 2016). Given individual interpretation through lived experiences are rarely objective or dependent upon numerical measurement, the quantitative method approach was not appropriate for this study. A mixed-method approach employs both qualitative and quantitative data (Castleberry & Nolen, 2018). Given that a convergence of statistical or mathematical data were not pertinent for this study, a mixed-methods approach was not appropriate. Gaining comprehension and an in-depth exploration of cost containment strategies that project directors use from rich contextual data, however, aligned with the

purpose of this study. Accordingly, the qualitative methodology was appropriate for this study.

I chose the case study research design because the purpose of the study was to explore successful strategies that project directors use to contain costs within successful ERP implementations. Choosing the correct study design depends on the intent of the research question (Baskerville, Baiyere, Gregor, Hevner, & Rossi, 2018; Chofreh, Goni, & Klemes, 2018). Whether a case study is exploratory, intrinsic, single, or multiple, a researcher uses the case study design to explore answers to the research questions of how and why (Yin, 2018). Using a case study also provides an opportunity for the researcher to control the scope, ensuring data saturation and completing a study in a reasonable amount of time (Fusch & Ness, 2015). A phenomenological research design involves a high demand of personal engagement, costs, and time (Wilson, 2015). Moreover, according to Wilson (2015), phenomenological research is about determining to what extent a person and world are separable and how the world of one individual overlaps with another's. While phenomenological research is often grounded in philosophical origins, this study was not. Ethnographic research is about the interpretation of sociocultural aspects of individual lives (Merriam & Tisdell, 2015). The purpose of this study was the exploration of cost containment strategies, rather than the cultural interpretation of an organization. Therefore, both the phenomenological and ethnographic research approaches lacked alignment with the purpose of this study. A multiple case study design was the most appropriate for an in-depth exploration of cost containment strategies through the interpretation of experiences by project directors and managers

from various organizations in Washington state who have successfully implemented ERP systems on time and within budget.

Research Question

What strategies do HEI project directors use to contain costs during a successful ERP implementation?

Interview Questions

1. What cost containment strategies did your organization review for its ERP implementation, and how did you decide which cost containment strategy would work best for your organization's ERP implementation project?
2. How did your organization assess the effectiveness of the strategies used for cost containment in your ERP implementation?
3. If risks were identified, what strategy or tool was used to ensure expenses remained in alignment with the ERP implementation budget going forward?
4. What, if any, strategies did you use during ERP implementation to address requests for changes or modification of requirements (technical, functional, or other) that had the potential to negatively affect the budget?
5. How were cost containment strategies communicated to stakeholders during ERP implementation, if at all?
6. How did you or your staff address requests made for additional resources or business process reengineering during ERP implementation that were not included in the budget?

7. How, if at all, were contingent costs related to changes in policy, whether internal or external to your organization, addressed within the ERP implementation cost containment strategy?
8. What other key challenges or barriers did you experience in developing and maintaining effective ERP implementation cost containment strategies?
9. How did your project team address the key challenges or barriers to the development and maintenance of your ERP implementation cost containment strategies?
10. What additional information would you like to share about your organization's cost containment strategies for ERP implementations?

Conceptual Framework

The conceptual framework for this study was the IT cost containment techniques (Gartner Consulting, 2006). Gartner Consulting developed the IT cost containment techniques framework in 2006 (Gartner Consulting, 2006). The IT cost containment techniques framework lists 25 techniques reported by case study interviewees as contributing significantly to meeting their cost containment goals (Gartner Consulting, 2006). The 25 techniques correspond with three focus areas under the cost containment framework; (a) linking costs to demand, (b) reducing resource costs, and (c) changing operating practices (Gartner Consulting, 2006). Strategic needs for IT differ among organizations and industries (Jafari, 2014). The IT cost containment techniques framework was appropriate for this study because the framework provided a basis for understanding the options project organizations can use for increased agility, increased

levels of service, and reduction in risks, for achieving HEI realized value from their IT investments.

Operational Definitions

The following are definitions of specific terms used in this study to assist the reader with greater comprehension and contextual meaning.

Business process re-engineering (BPR): Business process re-engineering is a three-tier mechanism that involves steps that require an organization to redesign and/or change existing business processes (Mohapatra, & Choudhury, 2016).

Cost containment: The total cost of implementing ERP systems are often expensive and highly complex (Tobie, Etoundi & Zoa, 2016); therefore, cost containment in the context of this study is a strategic approach to resource management based on HEI capacity to seamlessly support and integrate an ERP implementation within scope and budget.

Enterprise resource planning (ERP) system: An ERP system is a cross-functional enterprise system that integrates software modules to support core business processes and the organizational flow of financial, accounting, and customer information (Alok & Mocherla, 2016).

Scope: Project scope is a statement of work that clearly defines the work to be performed (deliverables) as agreed upon by key stakeholders according to expectations, requirements, and needs (Fageha & Aibinu, 2016).

Assumptions, Limitations, and Delimitations

Assumptions are inherent beliefs that can influence the design of the study and outcome of the research (Kirkwood & Price, 2013). The first assumption was that the HEI project directors chosen for my study were representative of the population of HEI project directors in Washington state. A second assumption was that the strategic cost containment measures used by HEI project directors were positively related to successful ERP implementation outcomes. A third assumption was that each of the HEI project directors chosen would candidly share their experiences to the best of their recollection. A final assumption was that the exploration of cost containment strategies through the interpretation of experiences by HEI project directors would provide greater understanding and adoption of options that can be used for increased agility, increased levels of service, reduction in risks, and HEI realization of value from their IT investments. Once data collection and analysis were complete, the findings indicated that these assumptions were accurate. The literature reviewed, interviews conducted, and the collected data and analysis revealed that cost containment strategies used were positively related to successful ERP implementation outcomes, and each participant offered greater understanding of cost containment options that can be used to support a successful ERP implementation in an HEI environment. The first assumption about chosen participants and their representativeness of the population of HEI project directors and managers in Washington state is questionable. Moreover, multiple case sampling should be theoretically driven on conceptual grounds as opposed to representativeness (Miles, Huberman, & Saldana, 2014).

A study design or instrument limitation is a systematic bias that the researcher cannot control and has the potential to inappropriately affect the results (Price & Murnan, 2004). I anticipated time constraints, costs, and potential data triangulation challenges as limitations for my study. First, given the participants were project directors and managers located throughout the state of Washington, my capacity to meet face-to-face with each of the participants was limited due to time and geographical constraints rather than costs, which also limited my ability to discern other observable elements, such as body language or facial expressions. Second, potential challenges with data triangulation were significantly reduced as archived reports and organizational documents that aligned with details obtained from the participants during the interview process were publicly available. The limitations of this study may provide areas for future researchers to expand on the results of this study.

Delimitations are characteristics within the researcher's control that limit scope and boundaries of the study (Yin, 2018). The first delimitation for this study was the purpose, which was to explore cost containment strategies used by HEI project directors to support a successful ERP implementation. The scope for this study was specific to HEI populations. Second, although there are lessons to be learned from ERP projects that failed to implement within budget or scope, failed project implementations were excluded from this study as the focus was on the exploration of strategies that HEI project directors use to contain costs to support successful ERP implementations within budget and scope. Other considered delimitations were the location and participants chosen for the study.

The delimitations provide areas for potential future research identified in Section 3 of this study.

Significance of the Study

The findings from this study have the potential to contribute to both business practice and positive social change for HEIs and associated stakeholders. HEIs serve a diverse population of people and can have global impact through successfully implemented ERP systems.

Contribution to Business Practice

While it is critical for a project director to balance scope, schedule, and cost, the impact of not doing so can have far-reaching consequences on the ability of HEI leaders to effectively train staff, realize achievement of change initiatives, transform organizational culture, and integrate educational processes for students (Abugabah et al., 2015). HEIs can use an ERP to consolidate disparate data and legacy systems while adopting the best practices associated with modern technology (Seo, 2013). The use of cost containment strategies by project directors leading ERP implementations within HEIs is essential for both tangible and intangible outcomes. Cost containment strategies can aid leaders in their goal to successfully implement ERP systems and ensure realization of target value from their IT investments.

Contribution to Positive Social Change

The implications for positive social change from identifying and understanding the cost containment strategies HEI project directors use during an ERP implementation include catalyzing individual excellence, attainment of shared goals, increased access to

information, and better work-life balance. Greater achievement of shared goals among internal and external stakeholders increases mutual goodwill (Sanchez, Terlizzi, & Cesar de Moraes, 2017) and increases trust in others. Employees can attain an improved capacity of knowledge integration and transfer (Azan, Bootz, & Rolland, 2017; Jayawickrama, Liu, & Hudson Smith, 2016) that could extend beyond the HEI environment, benefiting communities in terms of increased talent pools and skill sets for benefitting benevolent and charitable causes. Moreover, one of the most important implications for long-term positive social change is increasing student access to improved educational services (Weli, 2019). Increasing the success rates of ERP implementations in HEIs supports student accessibility to relevant software and data from their own devices with the appropriate Internet connection at anytime from anywhere in the world (Chauhan & Jaiswal, 2016).

A Review of the Professional and Academic Literature

This section is a topical review of professional and academic literature on the conceptual framework and related research aligned with the topic of this study. The research focus was directly related to cost containment strategies that HEI project directors can use to support successful ERP implementations. The review includes a thorough analysis of the conceptual framework and an exhaustive report on extant relative research. A well-synthesized and comprehensive literature review was the intent.

I began the literature review with a concise analysis of the IT cost containment techniques framework by Gartner (2006) in comparison to other cost containment strategies. I also examined, analyzed, and synthesized a broad history of HEI usage of

ERP systems, potential outcomes of cost containment strategies, and the challenges faced by HEI project directors. As appropriate, the literature review contains an examination of various viewpoints for contrast and comparison within the context of this study. Data within the literature review are from Google Scholar, ProQuest, ABI/Inform Complete, Emerald Management Journals, Sage Management, Gartner Inc., Business Source Complete, EBSCOhost, Educause, and a host of other business and information technology journals. The keywords used to search for relevant data included *cost containment, IT strategy and risks, HEI innovation, ERP implementation budget, information technology investment, ERP social impact, HEI project director, ERP investment success,* and *ERP implementations and HEIs*.

Of the 282 data sources identified, 254 (90%) were peer-reviewed. Two hundred twenty-nine (81%) sources had a publication date between 2016 and 2020. Of the total sources used in this study, 116 support the literature review equating to 57% of the total sources. There are 78 (67%) peer-reviewed sources and 87 (75%) sources within the literature review with a publication date between 2016 and 2020.

Information Technology Cost Containment Techniques Framework

Project directors can use the IT cost containment framework to identify strategies for saving money, improving service levels, increasing agility, delaying expenditures, extending beneficial outcomes due to reduction of complexity, and increasing flexibility in terms of business operations. Gartner's (2006) IT cost containment framework is one of few resources available that project directors can use to mitigate cost overruns in ERP implementations. According to a review of Gartner's IT cost containment framework, the

basis of the cost containment framework is to provide strategies for organizational leadership in their aim to develop savings in their IT department (Gartner, 2006).

This framework posits that risk exists or there is a potential for risk in terms of cost overruns (Gartner, 2006). The IT cost containment framework uses a mix of short- and long-term techniques to ensure an ongoing stream of organizational benefits, that also aligns with the goal of sustainment for ERP implementations (Chofreh et al., 2018). Moreover, project directors who understand their organization's cost structure and potential for cost optimization may find this framework suitable for practical use and application specifically toward mitigation of cost overruns linked to demand, changing operating practices, and less than optimal resource use. There is limited literature for review on IT cost containment strategies.

A valid framework to identify and assess the cost of ERP complexity for individual resources was developed by Momoh (2015). The cost of ERP complexity refers to the difficulty of estimating latent ERP implementation costs related to factors of variability, variety, cognitive, functional, structural, and integration (Momoh, 2015). Designed to inform an organization of potential costs concerning ERP resources from a complexity perspective, Momoh's framework is best suited for ERP pre implementation phases, rather than for strategies needed during ERP implementation. Given, the limited amount of literature available on IT cost containment frameworks for ERP implementation, complementary tools and applications may increase awareness of potential risks of cost overruns. One example is the use of application rationalization as a process to analyze overlapping functionalities, unused applications, and bottlenecks

within an ERP system that could lead to improved efficiencies and cost reductions (Mortensen, Hansen, Lokkegaard, & Hvam, 2016).

Goldstein et al. (2004) conducted a study to determine the state of IT funding in higher education. While the study was specific to HEIs and revealed IT cost management data from over 480 respondents (chief information officers) surveyed, the cost containment strategies offered were abstract in comparison to the framework provided by Gartner (2006). It is also important to articulate IT investment value beyond the context of cost as stakeholders often need to see the connection of how IT services strategically align with HEI mission and add value (Fageha & Aibinu, 2016; Grajek, 2018; Kirkwood & Price, 2013). Gartner's cost containment technique framework supports this perspective as it highlights opportunity costs for use by project directors and IT leadership within HEIs. Like Gartner, Grajek (2018) contended that understanding organizational cost structures (the cost of providing services), framing services in the context of what is mission critical, and reviewing IT investment at the institutional level rather than departmental level are paramount to recognizing opportunity costs.

The first step to cost containment in the Gartner (2006) framework is to understand both cost structure and savings potential. Cost structure comprehension involves analysis of organizational costs at varying levels—focusing on the largest expenses first, making benchmark comparisons of peer organizations, and analyzing IT costs from multiple perspectives (Gartner, 2006). The potential for cost savings involves managing demand and shifting from fixed to variable costs (linking costs to demand), reducing labor and technology costs (reduce resource costs), and changing the operating

model of information systems while improving business practices of the same (change operating practices; Gartner, 2006). While the use of each technique provides an opportunity for organizational savings, identifying which techniques to use and when as part of an IT strategy can improve service and agility and reduce risk because each technique focuses on a reduction of complexity (Gartner, 2006).

Colleges and universities can remain viable while using cost containment strategies toward a business model that ensures overall value (Soares, Steele, & Wayt, 2016). The American Council on Education and the Teachers Insurance and Annuity Association sponsored a roundtable to discuss opportunities for cost containment within HEIs without sacrificing an increase in innovation, affordability, and overall student success (Soares et al., 2016). The resulting report is rare as there are few studies that provide cost containment strategies for HEIs to support a sustainable and valuable business model. HEI leaders must determine how best to reduce costs, foster innovation, and provide quality education and services to students without offsetting growing expenses with higher tuition (Soares et al., 2016).

A finding of this study highlighted the need to explore the possibility of deploying business intelligence toward greater transparency and reimagining the entire academic enterprise (Soares et al., 2016). While the report focused on lowering costs and improving performance toward student success, it also illuminated why leaders within HEIs should understand the relationship between cost containment and educational innovation (Soares et al., 2016). Relevant to this study, visibility into project and IT service costs by HEI stakeholders and IT leaders may increase financial transparency.

Financial transparency allows for better decision making and often positive changes in the behavior of consumer IT consumption (Gartner, 2006).

Linking Costs to Demand

There is a growing desire by HEI administrators to ensure that IT system investments are strategic to organizational objectives (Puchol-Sanchez, Pastor-Collado, & Borrell, 2017). Requests for IT services are common and often a requirement for students, researchers, and academics (Alharthi, Alassafi, Walters, & Wills, 2017). To accomplish alignment between the business requirements of the HEI and its IT capabilities, Puchol-Sanchez et al. (2017) asserted that management from a comprehensive and holistic approach must be considered. Organization leaders who view IT implementations as projects without considering human involvement will fall short of reaching intended goals (Skoumpopoulou, Wong, Ng, & Lo, 2018).

Realized benefits from employee productivity are a result of better ERP system quality, smoother flow of information, faster business processes, integration, and better support for decision making via ERP features (Eid & Abbas, 2017). Accordingly, when ERP implementations align with organizational objectives and are sourced according to business requirements and processes, user satisfaction, service quality, and productivity are positively impacted (Eid & Abbas, 2017). Three techniques within the IT cost containment framework that can help project directors manage demands associated with costs, whether internal or external to ERP implementation, are (a) IT governance, (b) an IT project, program, or portfolio management office (PMO), and (c) chargebacks (Gartner, 2006).

Information technology governance. The establishment of an IT governance council to improve prioritization and investment decisions is key (Gartner, 2006). While a growing gap exists between disciplinary views, priorities, and practices of academics and practitioners, IT governance is a core activity that is either adopted or, at minimum, expected by most institutions (Gonzalez-Rojas, Gomez-Morantes, & Beltran, 2018; Shao, Feng, Hu, 2016). The role of IT governance is to ensure projects and programs are accurately prioritized, to manage risk, and to monitor the performance of projects (Li, Chang, & Yen, 2017; Szalay, Kovacs, & Sebestyen, 2017). Project directors who implement ERP systems have the task of satisfying stakeholders (Carton & Richmond, 2018) who include academics, curriculum leadership, administrative staff, executive leadership, students, and legislative stakeholders (public institutions). Understanding that IT governance has a positive moderating effect on the relationship of ERP investments and firm performance (Ali & Miller, 2017), establishment of an IT governance council is a critical component of a successful cost containment strategy.

Project directors who effectively communicate the relationship between IT investments (and costs) and business value creation tend to be more successful in helping institutions transition from legacy systems to ERP systems (Ajayi & Hussin, 2018; Selig, 2018). IT governance representatives who understand the relational concepts between IT investments and business value creation should be able to provide scalable and flexible governance policy, process, and decision support that results in time savings, costs, and related resources (Selig, 2018). Effective IT governance includes a complete assessment of the current state by identifying IT governance maturity and gaps with a focus on

development of the future state of IT governance that serves as a roadmap towards the end goal (IT implementation) (Selig, 2018). IT governance components should also include well defined work groups specific to portfolio investment management and program/project management for example, with assigned champions that ensure incremental deliverables are met, facilitate deployment, create visibility, and demonstrate progress (Selig, 2018).

Information technology project, program, or portfolio management office. Although commercially off-the-shelf (COTS) ERP solutions contain prebuilt software and inbuilt business process functions, an industry standard for ERP implementation strategies does not exist (Ali & Miler, 2017). A HEIs approach to the implementation process depends on its own business strategy and requirements (Ali & Miller, 2017). The creation of an IT PMO can help to ensure strategic alignment of project objectives with organizational objectives and improve project, program, and portfolio performance (Gartner, 2006). Additionally, the IT PMO gathers and shares project knowledge, develops competencies, implements standards, and conducts project evaluations (Otra-Aho, Arndt, Bergman, Hallikas, & Kaaja, 2018).

A PMO defines, maintains, and manages internal and institutional processes related to projects and portfolios (Hermano & Martín-Cruz, 2016; Szalay et al., 2017). Furthermore, the processes are developed with an intention to create economies of repetition toward execution of projects and reduction of project risk through quality assurance and common practice (Szalay et al., 2017). Cost management for PMOs involves maintenance of the project budget, performing cost/benefit analyses, and overall

financial monitoring of the project or portfolio of projects (Selig, 2018; Szalay et al., 2017).

Program, portfolio, and project performance. In organizational project management, the measurement for program success is the degree to which a program meets the needs and benefits for which it was undertaken (Mossalam & Arafa, 2016). The measurement for portfolio success involves the total investment performance and benefit realization of all projects undertaken (Mossalam & Arafa, 2016). Considered temporary, projects operate within the boundaries of parent organizations (Szalay et al., 2017). While the expectations of project implementation are to create value for the organization and its constituents, research shows that the degree of complexity of projects has increased (Koch & Mitteregger, 2016; Otra-Aho et al., 2018). A major premise of the Gartner (2006) IT cost containment techniques framework is to reduce complexity where applicable.

In terms of the organizational structure, the PMO either functions on an enterprise-wide level or it may be one of many departmental PMOs that manage projects from various departments or divisions within an organization (Bredillet, Tywoniak, & Tootoonchy, 2018). Given ERP implementations are one of the most vulnerable phases of a project and historically prone to failure (Ali & Miller, 2017), the performance of a project highly depends on strategies that help to minimize risk (Fayaz, Kamal, Amin, & Khan, 2017). Risk factors include ongoing projects, overall IT architecture management, and less than optimal availability of resources for organizational transformation (Ali & Miller, 2017). When ERP system implementation strategies align with organizational

strategy however, there is a greater likelihood that ERP implementations will be completed on budget and on time (Ali & Miller, 2017).

Specific to IT cost containment, an effective PMO also has first-hand knowledge of potential risk of budget overruns, schedule delays, and scope creep. Staff within the PMO office have the responsibility and expectation to communicate said risk(s) (Otra-Aho et al., 2018) prior to actualization. Not doing so could result in disruption of services, costly rework, unhappy clients, and unsatisfactory regulatory compliance and controls (Selig, 2018). Selig (2018) noted that managing risk involves (a) risk identification and analysis, (b) risk quantification and risk response, and (c) mitigation and contingency plan development. These processes are a systematic way to identify and act upon potential areas of uncertainty, issues, and concerns (Selig, 2018).

Chargebacks. Chargebacks are a function of service level management and support (Selig, 2018). As such, IT chargebacks refer to an accounting practice that recovers the costs of IT used to aid in the management of IT resources by allocating shared costs back to the profit centers that consume IT services (Baars et al., 2014). The practice of chargebacks encourages useful behavior by IT consumers at all levels as the practice is a tool to control escalating costs, align behavior with organizational goals, improve decision making, and facilitate a more effective use of IT (Baars et al., 2014). Chargeback data can help to increase the IT department's aptitude in terms of learning the demand profile of the institution's internal consumers (Choudhary & Vithayathil, 2013).

While chargeback practices allow for a reduction in IT costs allocated to the IT department, this technique can be difficult to explain and understand regarding intangible products. For this reason, Baars et al. (2014) noted a lack of successful chargeback models that are clear and acceptable to all stakeholders involved. However, integration of a chargeback model that supports an IT cost containment strategy that is well aligned with organizational objectives may be advantageous (Baars et al., 2014). A chargeback model used to support an IT cost containment strategy should provide (a) high accuracy of charge allocation, (b) a perception of fairness, (c) transparency, (d) controllability, and (e) ease of comprehension (Baars et al., 2014) to effectively communicate and attain stakeholder acceptance of its usage.

Shift from fixed to variable costs. A fundamental dilemma for IT leadership is to find a balance between variable and fixed costs (Dos Santos & Da Silva, 2015). Regarded as an unfair approach to service contracts by private and public organizations, fixed contracts that do not allow for a provision to terminate contracts with IT providers at any time or to change services as needed create an exorbitant amount undue stress between vendors or contracted services and IT leadership (Coelho, Cunha, & de Souza Meirelles, 2016; Dos Santos & Da Silva, 2015). Employing contingent workers as opposed to full-time workers, utilizing software as a service rather than a sunk cost, and capacity-on-demand are areas where cost opportunities exist in support of IT cost containment strategies (Gartner, 2006).

Reducing Resource Costs

Less than 10% of companies that implement ERP solutions do so without any adjustments to the COTS (Tomic & Jovanovic, 2016). Additionally, 25% of projects that involve ERP implementations require significant adjustment or extensive customization (Tomic & Jovanovic, 2016). While some universities face difficulties deploying scalable and flexible IT services other HEIs have enjoyed an increase in their capacity to serve their students (Alharthi et al., 2017). The implementation of cloud computing for example, enabled Washington State University's School of Electrical Engineering and Computer Science to expand several services offered to students and faculty (Sultan, 2010). Other benefits of cloud ERP systems include reduced up-front costs, improved follow up from the vendor, reduction of internal IT maintenance costs to support the system after project implementation, and shorter downtime between system enhancements and upgrades (Demi & Haddara, 2018; Gheller, Biancolino, & Patah, 2016).

Conversely, some organizations never realize return on investment (ROI) due to unsuccessful implementation of new technology into existing operations or actualization of losing large sums of money because the new systems are under-utilized or never used at all (Skoumpopoulou et al., 2018). ERP implementations at HEIs present a myriad of challenges in terms of preservation of perceived uniqueness, re-educating campus employees and merging a system of decades-old databases that come at a huge price (Seo, 2013). A strategy that involves techniques to reduce technology and labor costs where applicable, could help project managers and HEI leaders avoid some risk of costly

mistakes. Some IT cost containment techniques toward reduction of technology costs include server/storage virtualization, voice/data network reengineering, voice over Internet protocol, and open-source software. Gartner (2006) proposed staff reconfiguration, selective outsourcing, offshore outsourcing, and automated software distribution as potential cost containment techniques to reduce labor costs.

Changing Operating Practices

Gartner's (2006) IT cost containment framework highlights several effective techniques to assist project directors with changes in operating practices towards cost containment and ongoing cost savings. Changing operating practices to achieve reduction in operational costs may require a change in the information systems operating model or improvement to information systems business practices, or both (Gartner, 2006). In either case, it is possible for end users and implementers of an ERP system to have different interests, ideas, and perspectives about what a successful ERP implementation really means (Drummond, Araujo, & Borges, 2017). Several of the Gartner's techniques involve organizational change management.

Change management. Typically related to radical organizational change (Badewi, 2016), ERP implementation involves business process re-engineering that is often associated with demands of human and financial resources, significant risk, and organizational change (Altamony, Tarhini, Al-Salti, Gharaibeh, & Elyas, 2016; Drummond et al., 2017). Most HEIs are both human and knowledge-intensive organizations facing both internal and external pressures to not only maintain operational efficiencies but remain competitive in terms of educational services provided (Puchol-

Sanchez et al., 2017). Even when business and IT investment strategies are closely aligned, research shows that achievement of business outcomes also depend upon effective alignment from a social perspective (Fryling, 2015; Klein, Biesenthal, & Delhin, 2015; Luftman, Lyytinen, & Tal, 2017; Mohapatra & Choudhury, 2016; Ripamonti & Galuppo, 2016).

Gregor, Hart, and Martin (2007) explored the Australian Bureau of Statistics to determine if an organization's enterprise architecture could enable the alignment of business strategy and information systems and technology. Held in high regard by other federal agencies as a best practice organization, the Australian Bureau of Statistics was successful in developing 60% of its analytical software while retaining a loyal workforce that survived IT outsourcing initiatives and independent government reviews (Gregor et al., 2007). The study conducted by Gregor et al. sheds light on the importance of recognizing the value of social context just as much as business and IT strategy when seeking alignment towards organizational objectives.

Other Relative Theories: Contingency and Resource-Based View

Developed in the late 1960s, contingency theory is a behavioral theory that is used to examine how environmental variables influence the behaviors of organizations (Hwang & Min, 2015). One connection between contingency theory and IT cost containment framework involves occurrences that are often external to the ERP implementation project or not within the locus of control for the project director but have a direct impact on project outcomes. Even though an organization has little or no control over its external environment, awareness of its external environment helps the firm to

better adapt (Hwang & Min, 2015). Given, project directors cannot singularly produce successful ERP implementations, Hwang, and Min (2015) and Adade-Boafo (2018) affirmed ERP implementation requires committed, persistent, and effective leadership to achieve organizational goals. To this end, the IT cost containment framework by Gartner (2006) provides effective strategies that project directors can use in the internal environment, also known as an organization's endogenous resources and capabilities (Hwang & Min, 2015).

Project directors can use the IT cost containment framework to identify strategies for not just saving money, but also improvement of service levels, increased agility, delaying expenditures, and extending beneficial outcomes due to reduction of complexity and increasing flexibility. Adapting a contingent approach to this framework strengthens the project director's basis for making strategic decisions involving cost containment because understanding contingency theory may shed light on what external and internal environmental variables are influencing the organizations' ERP implementation success (Hwang & Min, 2015). Conversely, a strategic management theory known as the resource-based view of the firm premise that an organization attains competitive advantage based upon unique corporate resources that are valuable, difficult to imitate, rare and nonsubstitutable (Hwang & Min, 2015). While both strategies are well researched and validated, the resource-based view of the firm is not an applicable approach towards IT cost containment strategies as the very premise implies the potential for ERP system customization.

Higher Education Institutions' Usage of Enterprise Resource Planning Systems

In the early 1990s, ERP systems evolved from software packages designed to handle manufacturing and inventory related concepts to ERP systems across industries (Demi & Haddara, 2018; Singh & Arora, 2018). ERP systems in the 21st century span an entire organization to include business related functions and processes rather than production related operations as a main objective (Holmberg & Johansson, 2017; Kuntum, 2019). Designed to integrate administrative functions and business processes for business organizations (Singh & Arora, 2018; Weli, 2019), ERP systems within HEIs require a software solution for the automation of administrative functions, academic services, business processes, and an enhanced experience relating to student services (Chaushi, Dika, & Chaushi, 2017; Soliman & Karai, 2015). At the forefront of ERP adoption by HEIs is the capability to use integrated modern technology (Seo, 2013).

ERP systems can provide access to data from anywhere, in a real time environment (Ramli & Widayat, 2017) by eliminating the need to support separate customized legacy systems that are often dated and fail to provide efficient integration of data that meets institutional needs (Chaushi et al., 2017; Shatat & Dana, 2016). ERPs make it possible to quickly respond to both competitive threats and new revenue opportunities (Adejare, Shahzad, & Hassan, 2018; Awa, Uko, & Ukoha, 2017; Ramli & Widayat, 2017). The transition to ERP systems within HEIs has been challenging due to the complexities involved with an ERP system implementation that often requires a high demand of organizational resources (Ramli & Widayat, 2017). Despite the challenges and risks that HEIs face, the adoption of ERP systems continues to expand at a rapid pace and

the expectation of positive impacts as outcomes remain constant (Althonayan & Althonayan, 2017).

Although previous literature has shown that ERP systems were not designed specifically for HEIs, very little has been done to bridge the gap towards better suited information systems for HEIs in comparison to commercial ERP systems (Chaushi, Chaushi, & Ismaili, 2018). ERP vendors do not fully comprehend the needs of higher education, given higher education has unique organizational models, business processes, and objectives that support activities that are not common in corporate businesses (Singh & Arora, 2018). One of the most important objectives of ERP implementation in HEIs is to seamlessly support and efficiently integrate a myriad of administrative functions by using a systematic and cost-effective approach to gain strategic advantages (Thompson, Olugbara, & Singh, 2018). Successfully attaining this objective has been challenging given leaders within HEIs and vendors often have different ideas about the role of technology (Saas & Kemp, 2017).

As an example, Deloitte Consulting LLP reviewed publicly available data sources to identify preaward and postaward systems used in HEIs (Saas & Kemp, 2017). The results of the review indicated that research administrators find it challenging to achieve their operational goals, despite having a range of technology solutions available (Saas & Kemp, 2017). The greatest of challenges were institutional priorities of HEI leaders, market maturity of technological systems, and a lack of knowledge concerning research administration by software vendors (Grajek, 2018; Jha, Saini, & Jha, 2018; Saas & Kemp, 2017). To counter those challenges, a recommendation was made to include

research administrators in the decision-making process to choose systems that ensure requisite functionality and to determine which functions are needs vs wants to better understand the impact of service level choices (Saas & Kemp, 2017). Project directors who are responsible for ensuring a successful ERP implementation should also have applicable cost containment strategies as a tool to ensure realization of expected outcomes once deliverables and scope of the project are determined.

Pre-implementation, implementation, and post-implementation phases have direct effects on stakeholder's performance (Althonayan & Althonayan, 2017). If high standards of stakeholder performance are to be achieved, HEI leaders should focus on the preliminary stages and the implementation phases (Althonayan & Althonayan, 2017). The process of preparing for ERP implementations within HEIs should include identification of stakeholder perceptions and a plan to mitigate barriers that may exist (Ahmad et al., 2016). Like other industries, ERP systems within HEIs fail due to poor planning and preparation (Ahmad et al., 2016).

Funding of Higher Education Institution Information Technology Investments

Poor planning and preparation lead to budget overruns. The budget for an ERP implementation can run into hundreds of millions of dollars with expenditures estimated to range between 6% of a large organization's annual revenue and up to 50% for a small firm's annual revenue (Ahmad et al., 2016; De Toni, Fornasier, & Nonino, 2015). While the advantages of ERPs are well documented, packaged ERPs are challenging for HEIs to implement and typically require alteration and customization to better align with business

processes, that can be expensive and time consuming (Abugabah et al., 2015; Arthur, 2016; Noaman & Ahmed, 2015; Tobie et al., 2016).

The leaders of HEIs have critical concerns related to funding of expected IT-enabled efficiencies and innovations (Grajek, 2018). A common issue that leaders of HEIs face is how to guarantee value from IT investments (Adams, Martin, & Boom, 2018; Pereira, Ferreira, & Amaral, 2018). At the crux of the issue is an HEI unsustainable business model where the current cost to deliver higher education greatly exceeds growth in family income (Grajek, 2018; Soares et al., 2016). At the same time, internal requests to use technology integration with HEI initiatives, while facing external pressures to align with compliance requirements and mitigation of information security obstacles, for example, continue to increase (Adams et al., 2018; Grajek, 2018). While other industries have been successful at reducing cost structures and making the necessary changes to realize significant value from IT investments, HEIs have not been able to do the same because of sunk legacy costs and failure to successfully transition to new technologies (Grajek, 2018).

Regarding IT cost containment strategies, the goal is to achieve adherence to an approved budget rather than a sole focus on creating strategies to spend less on inferior products or services. Project directors and HEI leaders should determine how best to achieve competitive advantage with an IT cost containment strategy in mind. Competitive advantage for organizations is about having a superior position over and above competitors (Awuzie & Emuze, 2017). Likewise, HEIs are organizations that continue to innovate and develop competitive advantages within the education sector (Awuzie &

Emuze, 2017). Understanding that competitive advantage from a cost perspective is gained by either a cost leadership or differentiation model, project directors and HEI leaders must decide if the goal is to offer the lowest possible cost or to set its institution apart from its competitors in terms of the value provided to its constituents respectively (Porter, 1998).

Given the demand for ERP software since the 1990s has continued to increase despite reported failures, literature on how to avoid failure of expected outcomes in HEIs remain limited (Bhumgara & Sayyed, 2017; Chauhan & Jaiswal, 2016; Hooshang, Beheshti, Blaylock, Henderson, & Lollar, 2014). Changes to an ERP system's infrastructure takes a substantial amount of money, time, and effort before an organization realizes the benefits of the system (Hooshang et al., 2014). To avoid failure of expected outcomes, stakeholders should conduct preliminary analyses to evaluate the needs of the organization and assess the new technology to determine if the desired benefits are attainable (Hooshang et al., 2014; Yontar, 2019). To that end, total alignment of an organization's business strategies and its information system(s), i.e., ERPs, is imperative (Reynolds & Yetton, 2015; Puchol-Sanchez et al., 2017; Zouaghi & Laghouag, 2016).

Requests from top management is one of the main reasons for ERP implementations (Hooshang et al., 2014). Top management pursue ERP systems for reasons of efficiency and cost reductions towards competitiveness in the marketplace. Given the competitive environment within the education sector, efficiency of services and cost reduction are high priorities for leadership within HEIs. Jefferey et al. (2017)

discussed cost containment issues related to limited budgets, under-qualified personnel and changing leadership within the San Diego city school district, for example. San Diego is home for the eighth largest urban school district in the United States and the second largest district in California with an operating budget of $1.1B (Jefferey et al., 2017). The school district's ERP system is comprised of reporting, financial, human resource, project management, procurement, student information, food and health services, and student performance applications (Jefferey et al., 2017). The most important reasons for implementing an enterprise-wide system involved reduction of staff in the human resources and fiscal departments but gained efficiency and continuity in reporting throughout the system.

The risks for implementing a system-wide ERP system included scope creep, wide-scale deployment, software modifications, organizational change, issue escalation, negotiation concerns, and relevant IT experience (Jefferey et al., 2017). Specific to limited budgets were the persistent lack of funding, little investment in consultants, procurement of inferior solutions based on price, and less than 3% of overall school district funding was allocated for information technology investment (Jefferey et al., 2017). Other problems persisted in terms of organizational change. Convincing the district's top management to support the ERP implementation was a challenge because the school board did not fully support the ERP implementation (Jefferey et al., 2017).

School district leadership did not understand the service level agreement (SLA) needed for their business processes which resulted in a variance between projected requirements and actual requirements (Jefferey et al., 2017). IT staff for the San Diego

school district did not receive training as part of the ERP implementation process (Jefferey et al., 2017). As a result, more consultants, and external experts than projected were used to complete the implementation which led to cost overruns (Jefferey et al., 2017). The lack of experience by district leadership to negotiate with solutions providers also resulted in increased modifications, cost of implementations, technical support, maintenance, and upgrades (Jefferey et al., 2017). While there were cost savings, productivity improvements, and intangible benefits for implementing a district-wide ERP system, the cost containment benefits were straightforward, but did not justify the system (Jefferey et al., 2017).

Affecting positive organizational change, communicating key tradeoffs necessary to attain intangible benefits while improving productivity, along with incorporating best practices for management decision making positively impacts return on IT investment (Jefferey et al., 2017). Applicable to cost containment strategies, project directors and leadership of HEIs should invest time and effort in relationship building amongst constituents and employ a solid training program. Choosing the appropriate vendor(s) may also result in successful outcomes like user satisfaction with the system, increased productivity, stream-lined processes, and a smaller workforce (Jefferey et al., 2017). It is important for project directors and leadership within HEIs to understand that cost containment towards successful ERP implementations within budget requires an organizational effort. Successful cost containment strategies involve the commitment of all stakeholders.

Potential Outcomes of Information Technology Cost Containment Strategies

The definition of project success has evolved over time. Today, project success is largely defined by the satisfaction of stakeholders' needs rather than successful application of project management tools during the 1970s (Badewi, 2016). There are opposing views about organizational benefits of ERP systems. An ERP's inflexibility is one of the most cited reasons that managers consider replacing them with other solutions (Tenhiala & Helkio, 2015).

Although management of information outside of an ERP system may compromise data integrity, some organizations have begun to use stand-alone tools to replace some functionality of their ERP system (Campbell & Fogarty, 2018; Tenhiala & Helkio, 2015). Research also supports inconsistent ERP implementation characteristics and the inability of HEI leaders to explain ERP system quality of use (Campbell & Fogarty, 2018; Tenhiala & Helkio, 2015). Despite variant literature about ERP implementation failures, ERP systems have matured into an advanced technology capable of handling complex tasks and organizational functions given its unique integration characteristics (Ali & Miller, 2017; Tarhini, Ammar, Tarhini, & Masa'deh, 2015; Tian & Xu, 2015). Determining the suitability of an ERP system and cost management strategy in alignment with organizational goals is critical for the realization of organizational benefits (Abdel-Haq, Chatti, & Asfoura, 2018; Grajek, 2018).

Tangible Outcomes

Mentoring has an indirect effect on enterprise information system success at the individual level (Hsieh & Hsu, 2013). Mentoring from an operational perspective, is the

relationship between an experienced user and those that he or she provides guidance and assistance to help them learn how to use an enterprise information system to apply cross-functional process knowledge in business (Azan et al., 2017; Hsieh & Hsu, 2013; Mondisa, 2018). The effects of mentoring or lack thereof on information systems are indirectly related to potential cost overruns (Hsieh & Hsu, 2013). It is important for organizations to consider the positive effects of mentoring their staff in terms of in-house training not only for the intangible benefit of employee morale, but also for the benefit of tangible cost savings (Awa et al., 2017; Hsieh & Hsu, 2013).

Bailey, Seymour, and van Belle (2017) argued that ERP implementation is not only disruptive to users, but also impacts user work life. While the intention of training for users of enterprise information systems is to help the user become familiar with standard functions and interfaces of the system, training typically lacks transmission of tacit knowledge in cross-functional processes (Hsieh & Hsu, 2013). After reviewing 20 enterprise information system implementation cases, Hsieh and Hsu determined that users of a newly implemented system had inadequate process knowledge that resulted in costly and inefficient training. The excessive costs of retraining forced 50% of the organizations reviewed to increase their project budgets (Hsieh & Hsu, 2013).

When employees are properly mentored throughout information system adaptation, perceived usefulness, satisfaction, and intention to continue to perform at a high level persists, despite changes in operating practices (Hsieh &Hsu, 2013). Personal coaching is also key to improving the quality of decision making that needs to be made in a complex and dynamic situation (Hsieh & Hsu, 2013). Mentoring during the adaptation

of ERP implementation has a positive correlation with retaining employment which may have positive implications for reduction of resource costs (Hsieh & Hsu, 2013). The reduction of resource costs due to successful mentoring and coaching of personnel may produce significant cost savings for organizations considering an ERP implementation.

Intangible Outcomes

Project directors leading ERP implementations within HEIs who use cost containment strategies may have an indirect and positive impact on the lives of HEI stakeholders (Touir, 2016). In contrast, a hyper-focus on project deliverables involving iron triangle performance measures of cost, time, and scope creates problems at an organizational and individual level (Chih & Zwikael, 2015). Measuring project management success, without considering client or stakeholder satisfaction is problematic for inexperienced project managers (Chih & Zwikael, 2015). This may occur because intangible impacts are often harder to quantify than real, tangible impacts during ERP implementation (Mekadmi & Louati, 2019; Ramli & Widayat, 2017).

Abdel-Haq, Chatti, & Asfoura (2018) argued that intangible organizational benefits such as (a) an improved use of communication, (b) newly developed skillsets by stakeholders that use the system, (c) employee empowerment, and (d) development of a common language are attainable. People are the most critical element in ERP implementation outcomes (Touir, 2016). Motivation and morale positively impact the implementation of ERP systems (Ramli & Widayat, 2017). The positive impact of morale and motivation encourage and create conditions of effective and efficient use of the ERP system (Ramli & Widayat, 2017) towards business sustainment. Project directors and

HEI leaders are in the most feasible position to encourage and influence these types of conditions.

Social impact on individuals and communities

Having a vital role in the growth of societies, HEIs have become more dependent upon Internet-based services to provide constituents with cutting-edge technology in support of requested educational services (Alharthi, Alassafi, Walters, & Wills, 2017; Soares et al., 2016). The architecture of an ERP system can serve as a mechanism to improve communication by allowing people to see the various parts of how an organization fits together (Gregor et al., 2007). When business and IT strategies are appropriately aligned, the provision of real-time data allows for relevant interaction, an exchange of views that allow people to support one another, and the ability to make future plans in a collaborative method (Alok, 2016; Gregor et al., 2007; Kuntum, 2019).

One of the many benefits that ERP system implementation permits is the ability for end users to work from remote locations yet remain intricately connected to the daily operations of HEIs. When work is distributed from a decentralized perspective, both the employee and the organization receive mutual benefit. Some of the benefits are greater work-place autonomy for the employee, realization of cost savings, and well-being when the commute to work is lessened or no longer necessary (Ibrahim, Effah, & Boateng, 2017). According to a 2014 report by the National Childbirth Trust, women were also more likely to return to work after childbirth when their employers offered flexible working hours, job-sharing, and part-time hours (Avis, 2018).

Opposing views of working remotely suggest that a person's chance of promotion, pay raises, and performance evaluations may be limited as compared to their office-based peers (Avis, 2018). While ERP systems allow for more flexibility as users can access real-time data from anywhere once implemented, Avis (2018) argued that working remotely leads to inefficiencies that could negatively affect business performance without proper management. Although flexible work arrangements may create some challenges; the wellbeing, satisfaction, and productivity garnered outweigh the challenges (Avis, 2018).

Implementation of a new IT application represents change and end-user acceptance is at the forefront of a successful change implementation involving new information systems (Simatupang, Govindaraju, & Amaranti, 2016; Skoumpopoulou et al., 2018). Internet and web technology utilization continues to enhance the capacity and capabilities of stakeholders regarding collaboration of work without the barriers of physical location (Baskerville et al., 2018; Ibrahim et al., 2017). The rapidly changing environment of the workplace and learning platforms for students have also evolved beyond physical structures. With the increase in demand for a highly skilled business and IT workforce, HEI leaders have recognized the value that an ERP system provides their students from the context of student performance to meet workforce demand (Máté, Bács, & Takács, 2017; Reijnders & de Vries, 2018; Weli, 2019). Information is shared and collaborations can take place on a local, national, and global scale because of the adoption of IT, Information Systems, and ERP systems (Somayyeh & Ghaffari, 2018;

Wang & Lo, 2016). Having an IT cost containment strategy to support these achievements is paramount.

Challenges for Project Directors from an ERP Cost Perspective

Project management success is the responsibility of the project manager or director which means delivering the expected outcomes of the project on time and within budget (Sanchez, Terlizzi, & Cesar de Moraes, 2017). Strategic alignment of IT and an organization's business strategy, however, is a complex process. Few individuals within leadership roles fully understand the degree of their operational dependence on computer systems or the role to which IT plays in terms of shaping their firms' business strategies toward organizational sustainment (Jafari, 2014). Furthermore, costs are directly related to the risks, decisions and performance levels determined, executed, or derived from an organization's stakeholders and external environment (Althonayan & Althonayan, 2017).

The three most frequently selected manufacturers of ERP systems are Oracle, Microsoft, and SAP respectively (Soler, Feliks, & Ömürgönülsen, 2016; Tomic & Jovanovic, 2016). The largest discrepancy for the implementation phase of a project involves actual implementation time that does not coincide with the plan for implementation completion (Tomic & Jovanovic, 2016). Oracle, Microsoft, and SAP average between four (Oracle) and two (Microsoft and SAP) months beyond deadlines for implementation completion (Tomic & Jovanovic, 2016). Adaptation of cost containment strategies by project directors on ERP implementations may lead to business value optimization from their IT investments (Jafari, 2014).

There are other reasons beyond software that confound HEI ERP implementation failure. Software itself is rarely the source of implementation failures, but rather inaccurate internal controls, the lack of appropriate business policies and procedures, lack of workforce readiness assessments, and inefficient security policies for the entire operational environment (Noaman & Ahmed, 2015). These risks can be quite costly to HEIs. Some of the costs include heavy customization which can lead to project delays, an unreliable system, and overspent budgets (Garg & Khurana, 2017; Noaman & Ahmed, 2015). Moreover, poor consulting, poor knowledge transfer, and poor management effectiveness can result in resource drain, improper training, inefficient business processes, and less than optimal organizational productivity (Chayakonvikom, Fuangvut, & Cannell, 2016; Lech, 2016; Noaman & Ahmed, 2015). It is important for project directors to have effective cost containment strategies at the onset of an ERP implementation and the ability to adjust those strategies based upon contingent situations.

Risk of Budget Overruns

The five key cost areas that are most likely to result in budget overruns are integration and testing, data conversion, data analysis, training, and transition from consultants (Hillman-Willis, Willis-Brown, & McMillan, 2001). Configuration of modules within a software system, deployment, and initial training costs often exceed the purchase price by 300% (Briscoe, 2016). Understanding how employee characteristics impact adoption of ERP systems could translate to a substantial amount of savings for an organization striving towards a successful implementation (Briscoe, 2016; Mayeh, Ramayah, & Mishra, 2016). To reduce the potential of budget overruns, enterprise

systems require greater management control and uniformity in operational processes towards a cost containment strategy (Hillman-Willis et al., 2001).

Risks of Completion Overruns

The duration of an implementation project is directly linked to the scope of the project, available resources, functionalities of the selected software, and compatibility of the ERP system with the needs of the company (Panorama Consulting, 2017; Tomic & Jovanovic, 2016). Legitimization in terms of technology is the process of overcoming barriers or obstacles toward successful innovation (Hall, Bachor, & Matos, 2014). Legitimization has two dimensions (a) cognitive, which involves technical knowledge and industry analysis, and (b) sociopolitical, which involves societal value, cultural, and political influences (Hall et al. (2014). Development and diffusion of new technologies must incorporate strategies that recognize both dimensions of legitimization (Hall et al., 2014). One dimension without the other poses risk to a successful implementation and sustainment of new technology. Organizations that consider both dimensions of legitimization as part of their business strategies may avoid mishaps specific to unexpected and costly delays (Hall et al., 2014). Accordingly, using cost containment strategies may assist HEI leaders in their quest to ensure viable services and lasting organizational success.

The project team and technical possibilities are the two most important critical success factors for an implementation from a user's perspective (Reitsma & Hilletofth, 2018). Users of an ERP system understand that a project team should consist of the most competent employees from varying levels available, to include external consultants when

ERP expertise is missing (Hall et al., 2014; Reitsma & Hilletofth, 2018). There is also a need for a project champion to ensure adequate allocation of available resources and accommodation of organizational business needs (Reitsma & Hilletofth, 2018).

Users may have a generic understanding of the importance of adequate ERP system evaluation regarding its ability to facilitate their daily jobs, which involves business processes, internal and external relationships, strategy, size of the organization, and industry (Reitsma & Hilletofth, 2018). Alternatively, users' absorptive capacity for understanding, assimilating, and application of ERP systems improve when communication and trust are enhanced throughout ERP implementation (Mayeh et al., 2016; Migdadi & Abu Zaid, 2016). Users may have become more knowledgeable about ERP system integration and capability, to include the advantages and disadvantages of the system than in previous years. As such, the utilization of cost containment strategies by project directors are critical in terms of transparency, reduction of completion overruns, and protection of IT investment for HEI stakeholders.

Transition

Section 1 included the foundation and background information for this qualitative multiple-case study. The purpose of this study was to explore strategies that HEI project directors use to manage costs for a successful ERP implementation. The overarching research question focused on exploring strategies that HEI project directors can use to mitigate cost and completion over-runs in support of a successful ERP implementation. Section 1 also included the nature of the study, conceptual framework, along with a literature review on IT cost containment techniques framework. Section 2 includes

discussion about my role as the researcher, participants for the study, research method and research design, population and sampling, ethical research, data collection instruments, techniques, data analysis, and research reliability and validity. In Section 3, I will include the research findings, application of research findings to professional practice, the implications of the findings as they relate to social change, recommendations for action and future research, reflections, and the conclusion of this study.

Section 2: The Project

With this qualitative multiple case study design, I explored cost containment strategies that HEI project directors can use to support a successful ERP implementation. Section 1 contained the research problem and the academic literature supporting the development of this study. Section 2 contains a restatement of the purpose for this study and a discussion about the role of the researcher and the participants. Section 2 also contains a discussion about (a) the methodology and design for this study, (b) population and sampling, (c) ethical research, (d) the data collection instrument, (e) data collection technique, (f) data organization technique, (g) data analysis, and (h) reliability and validity of the study.

Purpose Statement

The purpose of this qualitative multiple case study was to explore strategies that HEI project directors use to contain costs to support a successful ERP implementation. The targeted population consisted of four HEI project directors and managers and one project manager from a public organization located in the state of Washington who have implemented cost containment strategies to support a successful ERP implementation. The project directors and managers have demonstrated success in using cost containment strategies to support successful ERP and IT implementations. Their experience and roles as project directors and managers were integral to the success of their respective ERP and IT implementations as they were uniquely positioned as the fulcrum among institutional leadership, external partners, and the end users. The implications for positive social change include improved student access to educational services, greater stakeholder

alignment of shared goals, and an improved capacity for knowledge integration and transfer to potentially benefit the broader community.

Role of the Researcher

In a qualitative multiple case study design, the researcher is the primary data collection instrument (Farooq & de Villiers, 2017). The role of the researcher involves selecting the appropriate research methodology and design (Chenail, 2011); the establishment of criteria, identification, and acquisition of participants; and collection, organization, and analysis of the data (Merriam & Tisdell, 2015). As the primary data collection instrument, I engaged prospective participants who met the criteria for the targeted population. I also conducted interviews with qualified research participants to answer the research question, used member checking to ensure accuracy of data collected; and organized, interpreted, and analyzed the data collected from all sources. Data collection occurred only after approval was obtained from Walden University's Institutional Review Board (IRB).

Transparency and detailed discussion about any relationships that the researcher may have had with the topic under study and or participants is critical because as the primary data collection instrument the researcher can pose the greatest threat to trustworthiness of the study (Chenail, 2011). I am an experienced accountant and business analyst who is familiar with managing multimillion-dollar budgets, software implementations in HEIs, and working as a change facilitator to prepare end users for business process reengineering. I have served in various roles as a project team member, accountant, bursar, comptroller, adjunct faculty, and director of finance. Since

completing military service in 2001, 16 of the last 19 years of my career have been in higher education.

Qualitative researchers, scientists, subjects, reviewers, and interested citizens follow *The Belmont Report*, which established standards for ethical principles, guidance, and an analytical framework to comprehend ethical issues involved in research of human subjects (Balon et al., 2019). *The Belmont Report* is a seminal source to explore the difference between research and practice, the three basic ethical principles (respect for persons, beneficence, and justice), and application of the general principles when conducting research (Adashi, Walters, & Menikoff, 2018; Wessels & Visagie, 2015). A researcher has an obligation to consider and apply ethical principles for human subjects who participate in research studies (Alshenqeeti, 2014; Balon et al., 2019; Karagiozis, 2018). Accordingly, I adhered to the ethical principles established in *The Belmont Report*. I took responsibility for ensuring the rights of the participants in this study were protected to include safekeeping of the data collected.

When researchers can acknowledge their personal view of the world and are able to discern their personal lens, the interpretation of the behavior and reflections of others become more transparent (Fusch, Fusch, & Ness, 2018). My professional and civic experiences have shaped my worldview about the allocation of tuition dollars and the expectations of intended return on investments by HEI leaders toward significant gains in social change, technological innovation, and institutional competitiveness. Because researchers cannot separate themselves from the research, it is important to recognize inherent biases (Karagiozis, 2018). As a current finance functional analyst working as

part of an IT project team implementing an ERP application for a system of community and technical colleges, I had the potential for personal bias and ideologies to affect the interpretation of the findings of this study. Given a researcher's worldview already exists in social research, whether intentionally or unintentionally, it is important to address strategies to mitigate bias (Fusch & Ness, 2015). Examples of potential bias may involve views and attitude of the interviewer and a tendency for interviewers to seek specific answers to support preconceived notions (Alshenqeeti, 2014). I managed to avoid the actualization of self-limiting biases that can restrict the ability to amass quality data by ensuring the views and interpretations of views generated were the participants' and not my own. I used the process of reflexivity to examine and determine if preconceptions, beliefs, assumptions, or values other than the participants' existed within the interpretation of the data. I found that in my quest to attain rich, contextual data relevant to answering the research question, persistent listening, asking pertinent follow-up questions to open-ended questions, and remaining connected to the participants left little room for distraction or the interference of my own biases during the data collection process. Developing a rigorous instrument worthy of approval by the IRB requires an exceptional eye for bias management as failure to identify biases may prohibit researchers' ability to conduct their study (Chenail, 2011).

An interview protocol is an instrument of inquiry to obtain robust data necessary to address the research question, increase the quality of data sought, and to support inquiry-based conversation (Castillo-Montoya, 2016). Researchers who create their own study-specific questions for interviews are interested in facilitating an interaction with

respondents to obtain rich data regarding the respondents' experiences, worldviews, and perspectives (Chenail, 2011). I consistently used an interview protocol and member checking during and after the interview as needed toward a firm goal of data saturation. I collected substantive data about successful cost containment strategies that project directors have used in support of ERP implementations within HEIs and other industries from the participants' perspectives, experiences, and worldviews. To keep negative, subconscious biases at a minimum, consistency in the interview process was paramount (Alshenqeeti, 2014). The interview protocol was appropriate for this study as I used it to collect quality, unbiased data from the participants' perspectives and not my own. In addition to the interview questions, the interview protocol included the procedures for the interview process, discussion about informed consent, and a script to ensure consistent information was shared with each participant.

Participants

There were five participants in this study. They were project directors and managers located in the state of Washington who have used cost containment strategies to support successful IT and ERP implementations within HEIs and other public organizations. It is the researcher's responsibility to ensure the qualifications of each participant align with the intended purpose of the study (Yin, 2018). Participants should have the expertise to answer the research question and provide the best opportunity to reach data saturation (Fusch et al., 2018). Using a multiple case study design, I chose cases based on the participants' capacity to provide a rich understanding of what and how cost containment strategies were used to support successful ERP implementations. The

value of qualitative research interviews depends on participants' ability to provide data relevant to the research question and the quality of data within their responses (Saunders & Townsend, 2016). Obtaining participant responses specific to the research question was at the forefront of this study. As the researcher, I established the criteria necessary for participation.

After IRB approval of the study, I began reaching out to potential participants via email. I introduced myself and the study and strived to garner interest in participation in the study. I did not conduct on-site recruitment. The targeted population was appropriate for this study because HEI project directors are integral to the success of an ERP implementation and are uniquely positioned as the fulcrum among HEI leaders, external partners, and end users.

Strategies for gaining access to the participants primarily included using the PMI international online database and the Higher Education User Group (HEUG) to contact potential participants via email. Although I am a member of the local PMI chapter in my community, I did not recruit potential participants at chapter meetings or events. As a member of HEUG, I have access to the organizational database, which allowed me to filter for HEIs in Washington state and the type of ERP software owned by institutions, and I retrieved direct contact information of project directors and project managers who have registered with HEUG and may be members of PMI.

When planning and operationalizing research, participants should be adequately determined and chosen by the researcher to provide range, depth, and notable data required for authentic analysis, reporting, and understanding and to include potential new

insights that could emerge (Saunders & Townsend, 2016). The participants chosen for this study were project directors and managers with recent experience using cost containment strategies to support successful ERP or IT implementations. Four of the five participants have relative experience as a project director or manager in HEIs and the other participant has over 15 years of project management experience specific to working with public organizations in Washington state. Establishing trust with participants is essential for acquiring the necessary data to complete a study (Yin, 2018). To this end, after the participants expressed interest, I individually met with four of the five participants at a mutually agreed upon public location to discuss the study further and to answer any questions they might have about their participation prior to gaining consent and scheduling a date to conduct the semistructured interviews. Offering flexible options for participants to take part in qualitative research may improve recruitment, response rate, and the overall process for accessing participants (Heath, Williamson, Williams, & Harcourt, 2018). Given geographical and time constraints for one participant, a discussion by phone sufficed prior to gaining consent to conduct an interview.

Research Method

The research method for this study was qualitative. Qualitative methodology involves research from an interpretive paradigm, which is subjective in nature (Tubey et al., 2015). Unlike quantitative research, the qualitative methodology is a catalyst for exploration of *why* and *how* individuals interpret their own experiences regarding a phenomenon (Merriam & Tisdell, 2015; Rosenthal, 2016). In alignment with qualitative

methodology, the purpose of this study was to gain greater comprehension from rich contextual data and an in-depth exploration of cost containment strategies.

Mixed and quantitative are two other research methods that researchers use to conduct research (Castleberry & Nolen, 2018). Frequency, intensity, or duration of behavior tends to be the focus of quantitative research (Castleberry & Nolen, 2018). Researchers who use quantitative methodologies have an objective to obtain a generalizable sample, which conflicts with the qualitative focus of gaining in-depth understanding of individual experiences which may not be generalizable across populations (Rosenthal, 2016). Researchers who conduct quantitative studies also seek to prove outcomes via statistical tests rather than gaining a better understanding of a phenomenon from the viewpoints of participants and obtaining rich data within the context of the participants' worldview (Castleberry & Nolen, 2018). The mixed method combines both quantitative and qualitative methodology (Yin, 2018). The intent of this study was not to prove outcomes using statistical tests on the data collected, but rather to collect rich contextual data from project directors and managers who could provide insight on how cost containment strategies can be used to support successful ERP implementations in HEIs; thus, a mixed-method approach was not the best fit for this study.

It is imperative that qualitative researchers consider which approach is best for data collection since the goal is to provide sound information toward answering the research question under investigation (Rosenthal, 2016). Accordingly, the question which grounded this qualitative study was: What strategies do HEI project directors use to

contain costs during a successful ERP implementation? Qualitative methodology provided the best option for capturing rich, contextual data that is relevant to the overall research question (Castleberry & Nolen, 2018). The qualitative methodology was most appropriate for this study.

Research Design

Options for qualitative design include ethnography, phenomenology, narrative inquiry, and case study (Yin, 2018). A case study design is an effective way of answering the what, why, and how of a phenomenon while allowing the researcher to explore an emergence of themes and ideas from multiple sources (Merriam & Tisdell, 2015; Yin, 2018). Researchers can use a case study to explore the complexities and the context of which phenomena under study exists (Yin, 2018).

Case study methodology according to Yazan (2015) has yet to fully evolve. A robust and rigorous case study design should have a foundation built upon construct validity, reliability, internal validity, and external validity (Yazan, 2015; Yin, 2018). Yin's approach to case study research is structured and relative to how a case is studied, i.e., scope, process, reasons behind the inquiry (Harrison, Birks, Franklin, & Mills, 2017; Yin, 2018). Conversely, Stake's approach is less structured in that it aligns with the notion that case study research should be free to evolve over time and focuses on what is studied rather than how (Harrison et al., 2017; Stake, 1995; Yazan, 2015). Clear guidelines for the novice researcher are absent in Stake's approach to research design (Yazan, 2015). While Stake's position does not support a structured or detailed research design, Stake emphasized the need for researchers to have a firm data gathering plan and

specific data collection instruments (Yazan, 2015). In alignment with Yin's approach, researchers should provide a detailed design of how he or she plans to conduct research and adjust details as necessary throughout the process (Harrison et al., 2017; Yazan, 2015; Yin, 2018). As designed, I conducted a multiple case study.

HEIs have their unique brands, cultures, histories, enrollment sizes, missions, and technological endeavors, for example. Project directors and managers chosen to participate in this study had comparative and contrasting experiences from various HEIs and organizations. Each of the project directors and managers contributed a substantive amount of data specific to their own personal and professional experiences, that added to the depth and richness of the data in terms of case analysis. Relative to the research question and the associated responses provided from the interviews, I found that each of the participants incorporated some semblance of project governance and PMO, resource allocation, organizational change management, and vendor negotiation as key elements within their cost containment strategies. The multiple case study approach is used when the researchers' goal is to explore both replication and differences of the findings across cases (Lashgari, Sutton-Brady, Soilen, & Ulfvengren, 2018). While conducting cross case analysis, I found there were more similarities than differences in terms of cost containment strategies used. However, there were nuances regarding how and to what extent the cost containment strategies were applied throughout the implementation process.

Other designs, such as ethnography, phenomenology, and narrative inquiry, did not align with this study. The main foci of ethnography, phenomenology, and narrative

inquiry are on the exploration of human cultures, the view of the humans who have a lived a researched phenomenon, and an understanding of human experiences through storytelling, respectively (Adams et al., 2018; Rawdin, 2018; Wilson, 2015). I did not intend to explore the sociology of human cultures or describe an incidence of a phenomenon in the past, but rather share insight from knowledgeable HEI project directors who have used proven cost containment strategies to support successful ERP implementations. Therefore, I did not capture data related to human experiences through story telling.

A multiple case study design was appropriate as the participants in this study reflected on current and prior experiences from different HEIs as well as current and prior experiences from other organizations where appropriate. A multiple case study provides an opportunity to conduct a holistic and contextualized analysis by collecting a range of data from interview participants from a variety of institutions (De Toni et al., 2015; Merriam & Tisdell, 2015; Yin, 2018). I aimed to explore and obtain contextual data as it related to the conceptual framework and research question for this study. I obtained data from a combination of written sources, digital sources, and five semistructured interviews from project directors and managers with extensive experience in utilizing cost containment strategies to support ERP and IT implementations within HEIs and other public organizations within Washington state.

Data saturation is a requirement for qualitative studies (Yin, 2018). Saturation of data occurs when new data is no longer present from subsequent interviews and when the most recent interview data are consistent with previously collected data (Fusch et al.,

2018; Tran, Pocher, Falissard, & Ravaud, 2016; Yin, 2018). Data saturation was achieved through the collection of repetitive data from participant interviews, archival data, and organizational documents. While analyzing data obtained from the fourth and fifth interviews for common themes and emergent subthemes, it was apparent that no new themes or data emerged that was entirely different or exceptionally significant from previous data collected. No new data or themes emerged. I discontinued recruiting and interviewing participants as data saturation had been achieved.

Population and Sampling

In qualitative research, sampling is a deliberative process of selecting or discovering context and or participants who can provide rich and robust amounts of data based upon the phenomenon of interest (Moser & Korstjens, 2018). Most qualitative researchers rely on purposive sampling when aiming for data saturation as the goal is to choose case studies that will magnify the questions under study (van Rijnsoever, 2017). I used the purposeful sampling method for this qualitative multiple case study. Purposeful sampling is a tool that can be useful in identifying participants whose knowledge and expertise may provide consistency of emerging themes (Whitehead, 2004).

The targeted population was HEI project directors who are members of PMI, located in the state of Washington who have implemented cost containment strategies to support a successful ERP implementation. Other criteria for choosing participants involved geographical accessibility and convenience. Central to the study research question was discussion about the participants' experience, proven cost containment strategies that other project directors or managers can use, potential risks involving costs,

communicative tools, and contingent situations that may lead to budget and completion overruns. Specifically, each of the participants had either 5 years or greater of successful ERP implementation experience within HEIs as a project director or project manager or more than 9 years of successful ERP implementation experience as a project director or manager from any industry as a minimum. The targeted population was appropriate for this study because HEI project directors are responsible for maintaining the scope, budget, and successful completion of ERP implementations and pivotal in terms of stakeholder engagement among HEI leaders, external partners, and the end users.

Purposive sampling in case study research is specific to appropriateness, purpose, and access to information-rich cases (Fletcher, Zhao, Plakoyiannaki, & Buck 2018). A purposive sampling will have specific criteria and the sample size will be limited (Awa et al., 2017). I selected cases with care to ensure that insight in alignment with the research question for this study was obtained. To limit the potential of researcher bias, I also selected diverse participants who had a variety of project management experience working within HEIs and other organizations. The random sampling method would not provide the same opportunity for obtaining rich, contextual data. Semistructured interviews were conducted at an agreed upon location within a quiet office that allowed for confidentiality and freedom of thought without distractions.

Adequacy of sample size in qualitative research pertains to whether the sample composition and size is appropriate for the study (Vasileiou, Barnett, Thorpe, & Young, 2018). The minimum size of a purposive sample is difficult to estimate in terms of data saturation (van Rijnsoever, 2017). Determining sample size prior to the start of the

interview process may be a problematic approach in interpretive models of qualitative research (Sim, Saunders, Waterfield, & Kingstone, 2018). While the initial intent was to acquire six participants for the interview process, I aimed to invite as many participants who met the criteria for selection until data saturation was achieved. Following participant selection through purposeful sampling and the participants' agreement to participate in the study, each participant received, read, acknowledged, and signed the consent form to participate in the study.

Data collection should continue until the point no new concepts or codes emerge (Fusch & Ness, 2015; van Rijnsoever, 2017). I continued to interview additional participants who met the criteria for this study until there were no new concepts or codes that emerged. My actual sample size was five participants instead of the six initially estimated. Meaningful qualitative research is more about the richness of the information from the selected cases than with the sample size (Fletcher, Zhao, Plakoyiannaki, Buck, 2018; Miles & Huberman, 1994). What became evident is that I was able to confidently obtain valid and reliable responses from a smaller sample size where through the course of methodological triangulation of data; emergent themes became repetitive producing no new themes and data saturation was reached. While the concept of data saturation is not difficult to comprehend, achieving data saturation often depends on the way data are collected, the topic, participants, and the purpose of the research (Tran et al., 2016). I was consistent in my approach to reach participants by email, phone, or in person and with how I conducted the interview process via an interview protocol (see Appendix A).

Ethical Research

An essential step for the researcher is to ensure that all participants have provided their informed consent (Alshenqeeti, 2014). All participants must provide their informed consent by signing the consent form before participating in the proposed study. Where audio recording was used, verbal consent was also obtained. Once participants expressed interest in participating in the study, the consent form was sent by email to allow participants ample time to review the content. I also reviewed the consent form with each participant at the start of the interview process to ensure each participant understood the intent of the study. The IRB has three main purposes: (a) enabling researchers to conduct scientific processes by which new data and knowledge are rigorously acquired that may benefit the public and society as a whole, (b) ensuring voluntary participants within human studies are adequately protected, and (c) limiting exposure of litigation to institutions (Balon et al., 2019). I strove to professionally and effectively communicate the purpose of the study to include clarification about ethical protections before participants made an autonomous decision about their participation. In addition to informing participants that their participation was strictly voluntary, I reiterated that withdrawal from the study could occur at any time by notifying me in writing if they wished to withdraw from the study.

When working with human subjects, researchers should commit to following established ethical principles, considerations, and standards as determined by *The Belmont Report* (Balon et al., 2019). I adhered to the three basic ethical principles of (a) justice, (b) respect for persons, and (c) beneficence while conducting the research for this

study. Justice in terms of research involves situations where participants may benefit in some manner from the research (Adashi et al., 2018; Balon et al., 2019). There is little evidence that suggests what monetary amounts are appropriate for achieving high participant rates when conducting qualitative studies (Kelly, Margolis, McCormack, LeBaron, & Chowdhury, 2017). No monetary incentives were offered for participation in this study.

Given interviews can be considered an in-depth view into a participants' life regarding sensitivity of questions asked and the time required to conduct the interview process (Adashi et al., 2018; Alshenqeeti, 2014), respect for participants was critical to the success of data collection. While participation in this study did not pose immediate safety issues or risks to the participants' well-being, minor discomforts may have included room temperature in terms of the interview setting or stress brought on by daily life occurrences. I ensured room temperature was adequate for each participant where face-to-face interviews were conducted. Ethical issues should be addressed at all stages of the interview process (Alshenqeeti, 2014). I did my best to ensure that each participant was comfortable and free of distraction throughout the interview process whether by phone or face-to-face, where possible.

Beneficence involves the necessity of the researcher to limit the risk or potential harm to participants (Adashi et al., 2018). I explained to each participant that the data from the interview would only be identified within my database and data analysis software according to an assigned identifier. All study documents collected (electronic and hard copies) along with the consent forms will continue to be stored in a fire-

protected, locked safe for 5 years from the completion of this study. After 5 years, all raw data pertaining to the study will be destroyed as paper files will be shredded and electronic files will be permanently deleted.

I made every effort to maintain the privacy of participants and to keep their personal information confidential throughout the entire study. To reduce risk in breach of confidentiality, researchers may use pseudonyms to protect the identities of individuals and organizations (Rawdin, 2018). I used pseudonyms to protect the identities of individuals within this study, such as C1, C2, C3, etc., for participants. I explained that I will be the only person with access to the name of each participant that is associated with each of the pseudonym identifiers. I have kept in mind the relevancy and guidelines of *The Belmont Report* and rigorously followed the rules set forth by the IRB after gaining approval to conduct research. My Walden IRB approval number for this study is 12-16-19-0735873 and expires on December 15, 2020.

Data Collection Instruments

I was the primary data collection instrument in this study. The most commonly used qualitative data collection methods are focus group discussions, participant observations, and face-to-face, in-depth interviews (Moser & Korstjens, 2018). Primary data collection for this study was in-depth face-to-face semistructured interviews. Other sources of data collection included archived data and organizational records that were publicly available. Given qualitative research largely involves a process of inquiry, the goal is to obtain a rich and robust understanding of the research topic. An interview protocol is appropriate for a qualitative multiple case study as it provides the researcher

and participant with a structured process for collecting data (Castillo-Montoya, 2016). I used an interview protocol (see Appendix A) as guidance for collecting data throughout the interview process and to help ensure data is consistently collected in the same manner for each of the participants.

I conducted 40 to 60-minute semistructured interviews with each participant to explore what cost containment strategies project directors can use to support a successful ERP implementation within HEIs. The voices of participants are captured during semistructured interviews to allow experiences and viewpoints to emerge from the participant's perspective toward greater understanding of a phenomenon (Mortensen et al., 2016; Yin, 2018). The semistructured interview technique was appropriate for this study because the focus was on obtaining a rich and complex understanding of the participants' viewpoints and experiences.

I conducted three in person, face-to-face interviews, while the remaining two were interviews were conducted over the phone. If face-to-face interviews are not possible due to location or timing issues, interviews may take place by Skype or another form of video conferencing agreeable to the participant. When participants are geographically dispersed and travel costs are concerns, Skype interviews are an efficient alternative to face-to-face interviews (Heath, Williamson, Williams, & Harcourt, 2018; Hershberger & Kavanaugh, 2017). Given, geographical constraint, time, and participant choice, two interviews were conducted by phone. I asked each participant, regardless of interview methodology, for permission to record the interview, which could also be stopped at any time upon request.

Beyond sample size is the importance of collecting adequate data (Vasileiou et al., 2018). I used complementary sources in conjunction with the semistructured interviews to enhance validity of the findings. I used archived data and organizational records as part of the data collection process. I collected relevant documentation associated with information obtained from the participants during the interview process from publicly available sources online. I also reviewed data that participants openly shared about publicly disclosed project or organizational documents relevant to the purpose of this study (i.e., strategy or change management documents, project plans, budgetary information, news articles, etc.). Themes and patterns will emerge throughout the data collection process (Castleberry & Nolen, 2018; Chowdhury, 2015; Vasileiou et al., 2018). To achieve data saturation, I also collected archived data from credible Internet searches, the PMI, and HEUG organizations' written materials.

Developed to assess validity in qualitative research, member checking can enhance the trustworthiness of study results if researchers involve the participants in the interpretation of data (Birt, Scott, Cavers, Campbell, & Walter, 2016; Simpson & Quigley, 2016). I asked for clarity when needed throughout the interview process to ensure that my interpretations of the participants' responses were correct. Additionally, I set aside 30 minutes after each interview specifically for member checking as an opportunity to ensure my interpretations of the participants' responses to the interview questions were accurate, which enhances the reliability of the study. I also provided my interpretations to each participant for their review upon request. Allowing participants to review the researcher's interpretation of responses helps ensure the data represents the

participants' responses and perspectives rather than the perspective of the researcher (Adade-Boafo, 2018).

Data Collection Technique

I used three data sources for this study: semistructured interviews, archived data, and publicly available organizational records. I contacted participants to explain (a) the research purpose, (b) the interview process, (c) and the desire to obtain their consent acknowledging their acceptance of participation in the study. An interview protocol was used as a consistent guide to conduct each interview (see Appendix A). Publicly available, archived data and organizational records were obtained through credible Internet sources and generally corroborated data collected during the interview process for each participant.

An advantage of face-to-face interviews is that participants could be signaling that they are more serious about the research, provide fewer misleading responses, and enhance communication with the researcher (Kilinc & Fırat, 2017). Disadvantages of face-to-face interviews include restrictions on the participant to answer questions at a place and time rather than choosing to do so in an environment that allows them to be free to participate as they choose (Kilinc & Fırat, 2017). Another disadvantage is that face-to-face interviews do not allow for increased anonymity as compared to online surveys (Kilinc & Fırat, 2017). Regardless of methodology, the interests and motivations of the participant is what drives voluntary participation rather than the independent setting in which the data collection takes place (Kilinc & Fırat, 2017).

Archived data and organizational records were insightful and important compliments to the interview data collection method. The primary advantage of archived data and organizational records is the ability to triangulate and assure validity of responses provided by participants during an interview (Fusch et al., 2018). An additional advantage is to enhance the reliability of the research findings (Fusch et al., 2018; Houghton, Casey, Shaw, & Murphy, 2013). A limitation of digital data from computer software is that the user is often bound by the context provided by the data provider which may limit interpretive capacity (Maher et al., 2018). Other disadvantages may include data retrieval of information that lacks rich detail or neglects to capture a range of perspectives within the context of the research question (Maher et al., 2018).

An accurate account of the dialogue during the interview process is critical to the credibility of the subsequent transcription process (Rosenthal 2016; Simpson & Quigley, 2016). Researchers should consider having more than one recording device available to avoid interruption during the interview process should one device malfunction (Rosenthal, 2016). I had two recording devices available for use at the time of each interview. To make the data collection during an interview more accessible, audio files and note-taking must be transcribed accurately and clearly in written text (Azevedo et al., 2017). Notes were taken throughout the interview process, observations were made, and recordings via a cell phone application and digital recorder were used for the duration of each interview. I also took brief notes to annotate body language and follow-up questions toward clarity or greater understanding.

The interviewer should also prepare for potential setbacks throughout the interview process (Azevedo et al. (2017). To mitigate obstacles, the researcher should have backup copies of all recordings kept on a separate storage device from the original, have the materials necessary for transcription readily available, and determine the type of transcription to perform (Azevedo et al., 2017). The recordings were saved on two separate devices (e.g., digital recorder and thumb drive). The two types of transcription are naturalized, which includes contextual and nonverbal information, and denaturalized, which omits the nonverbal data (Azevedo et al., 2017). I used the naturalized form of transcription.

Although the experience of the transcriber and quality of the data may impact the amount of time it may take to transcribe, the analytic process is necessary to ensure the confidentiality of the participants (Rosenthal, 2016). Guidelines for transcribing interviews include (a) writing up the responses based upon the questions asked, (b) categorizing the responses according to the questions asked to include coding, and (c) comparing coded data across the multiple cases which also includes distinct outliers of information provided by participants (Van den Berg & Struwig, 2017). Researchers can use a six-step process to transform oral speech into written words (Azevedo et al., 2017). I used a detailed six-step procedure for transcription: (a) prepare, (b) know, (c) write, (d) edit, (e) review, and (f) finish.

Preparation for transcription included ensuring the interviews took place in a quiet office space with no one else but the interviewer and interviewee present. One advantage of having a quite space is the potential to limit external distractions. Each of the face-to-

face interviews took place in an agreed upon location where distraction from the interview process was minimized. The interviewer should review the recordings several times to familiarize himself or herself with the content and speech peculiarities therein (Azevedo et al., 2017). It was necessary to review the recordings for each interview several times to ensure accuracy of the transcribed data. The goal was to transcribe the data recorded in written format, word for word. The second step within the transcription procedure is know which involves organization of the field notes taken and determining which notes should be analyzed for clues or useful information during transcription (Azevedo et al., 2017). I recorded my observations, notes, and follow-up questions in a precise and organized manner according to each question and response.

The purpose of the writing phase in the 6-step procedure is to listen and write, ignoring punctuation, nonverbal interactions between the interviewer and interviewee, and emotional elements (Azevedo et al., 2017). The first iteration of data transcription involved ignoring punctuations, nonverbal interactions, and emotional elements as attention to detail was paramount in terms of accurately capturing the data obtained in writing. The focus was to accurately record in writing all dialogue that took place during the interview process and to ensure that all information is properly transcribed during this step. Thematic coding and analysis took place later in the transcription process.

Editing as the fourth step in the transcription process frames the conversation in a coherent manner, giving the data proper structure without misrepresenting interpretation of the text (Azevedo et al., 2017). I referred back to the discreet notes that I took during the interview process and included punctuations, nonverbal interactions, and emotional

elements where relevant, as part of subsequent iterations of transcription and review. This process was the most challenging as the recordings were reviewed, paused, and reviewed again to ensure distinction of oral information and retainage of emotional and nonverbal aspects where applicable. This step is also critical as the researcher must be careful not to edit according to interpretation, but rather note within the transcription what oral corrections have been made or ignored (Azevedo et al., 2017). To keep the integrity of the data, I asked participants to confirm corrections, if any, during the member checking process.

Step five of the transcription process is to compare the completed transcription with the recording in its entirety, checking for accuracy of information transcribed (Azevedo et al., 2017). While the preference was to have another person or third-party external to the process review the transcription in accordance to the recordings, I performed the task instead, which negated additional cost to conduct this study. The researcher should identify any discrepancies or points of disagreement that may have been overlooked or potentially omitted in error (Azevedo et al., 2017). I did notice a few words and punctuations that were omitted from the complete transcript after several reviews. When identified, I repeated step five in the transcription process until inaccuracies were no longer apparent.

The final step of the six-step procedure is to determine what to do with the recordings and whether to have one or two transcript versions (Azevedo et al., 2017). The full-length naturalized transcript is a relevant resource according to its purpose. For each participant, I have one full-length naturalized version of the transcript and a transcript

where data has been reduced to relevant, rich, contextual responses that specifically pertain to the research question for this study. I will keep each of the transcripts locked in a safe for 5 years after the completion of the study. Even though the identities of the recordings are confidential, there is no need to keep the recordings beyond the set duration designated by the IRB.

Accuracy of information is paramount to the validity of the data collection process (Mortensen et al., 2016). Each participant should be afforded the opportunity to review the information obtained during the interview process to ensure the data accurately represents their views about the phenomena under study as well as the opportunity to contribute edits or revisions deemed appropriate (Birt et al., 2016; Houghton et al., 2013; Smith & McGannon, 2018). Participants were provided the opportunity to review and confirm or correct my interpretations of their responses to the interview questions during and after the interview process.

Data Organization Technique

There are several ways to track, code, and store data for analysis. I used NVivo 12 Plus software to manage, organize, and analyze the collected data. While NVivo lacks the ability to fully stage the entire data analysis process, it does provide exceptional data management and data retrieval capabilities that supports data analysis and reporting (Houghton et al., 2013; Maher, Hadfield, Hutchings, & Eyto, 2018). As technology advances, the use of electronic filing is common and efficient (Maher et al., 2018; Swanier, 2016).

Another strategy involves the practice of reflection. Reflexivity is an important concept because it allows the interviewer to pensively consider the asymmetrical relationship of the interviewer and interviewee by speculating on ways that interaction could exacerbate presumptions based upon obvious sources, cultural background, and political orientation as examples (Maher et al., 2018). Keeping a reflexive journal aided in my effort to address any distortions or preconceived notions that could have been unintentionally introduced into the qualitative design. I transcribed data from the semistructured interviews while paying close attention to specific themes and similar responses between each of the participants. Data can be organized according to themes and participant responses to the research questions (Rosenthal, 2016; Swanier (2016). Keeping notes, archived data, organizational documents, and other resources organized in alignment with the data retrieved from each participant during the interview process was key to an exhaustive analysis of the collected data. As mentioned previously, all raw data pertaining to the study will be stored securely for 5 years. After 5 years, all raw data pertaining to the study will be destroyed.

Data Analysis

Researchers use triangulation of multiple sources to achieve data saturation (Fusch et al., 2018). The four types of triangulation are theory, investigator, methodological, and data (Fusch et al., 2018). Theory triangulation is based upon application of different theories, alternative theories, or the development of new theories determined by the raw data (Fusch et al., 2018). Investigator triangulation lessens bias given different investigators observe the same data, so the data interpretation may not be

the same (Fusch et al., 2018). I did not conduct investigator or theory triangulation as the goal for this study did not include observing or simulating previous data, developing or applying different and alternative theories, respectively. While researchers often use the terms data triangulation and methodological triangulation interchangeably, data triangulation involves collecting data from multiple sources using three inter-related data points: people, space, and time (Fusch et al., 2018). Methodological triangulation involves the use of several sources of data and more than two data collection methods that contribute to the reliability of results (Fusch et al., 2018; Houghton et al., 2013).

I used methodological triangulation as a primary strategy for data analysis. Archived data and organizational documents provided relative insight and added to the richness of the data collection process. Using methodological triangulation may help to mitigate researcher bias and enhance the credibility of data (Fusch et al., 2018; Ravitch & Carl, 2015). Methodological triangulation was also used to strengthen the validity of the multiple case study design. Where possible, I retrieved publicly available documentation to substantiate data retrieved.

I followed Miles and Huberman's (1994) model to analyze data methodically to reduce extraneous data and to review data through the lens of the conceptual framework. Properly adhering to the data reduction process is the first step for data analysis (Miles & Huberman, 1994). Data reduction is the process of selecting, focusing, simplifying, abstracting, and transforming the collected data written in field notes or transcriptions (Miles & Huberman, 1994). Data reduction involves managing and comprehending the data collected to later make appropriate assertions about the emergence of issues, themes,

patterns, and concepts (Leung, 2015; Miles & Huberman, 1994). I initially organized data by the pre-established interview questions while remaining open to new themes or meanings derived from the data collected (i.e., interviews, archival data, and organizational records). I reduced data based upon the relevance of the data in accordance with the research question for this study. I also paid attention to the frequency with which similarities and differences in data occurred to include the intensity of expression through the recordings, field notes, and observations noted.

The second element of Miles and Huberman's (1994) model for data analysis is data display. After data reduction, researchers use data display, whether text, chart, matrix, or diagram, to provide a way of arranging and thinking about rich contextual data (Miles & Huberman, 1994). Data display is a process that researchers use to discern systematic patterns and interrelationships (Miles & Huberman, 1994). I used a data display matrix to analyze participant responses to each research question. Higher order categories or themes may develop or emerge aside from the initial themes or categories discovered during data reduction (Miles & Huberman, 1994). Using a data display matrix was sufficient for visually analyzing overlapping responses across participants and patterns of similarities and differences regarding successful strategies used. As I began to analyze and make sense of data using data reduction and data display, themes emerged to include associations with the chosen conceptual framework.

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. Hycner (1985) and Maher et al. (2018)

emphasized listening to the interview for a sense of the entire interview. I listened to the recordings and read the transcriptions multiple times. Listening to the recording and reading the transcription will inform the researcher of contexts towards an emergence of specific themes and meanings later (Hycner, 1985). Once specific clusters of meaning emerge from the extrapolation of data, the researcher should then determine if a central theme that represents the essence of the identified clusters exist (Hycner, 1985).

After reviewing the transcription for completeness, I made notes on a separate spreadsheet of the various consistencies in responses between the interviewees. I also reviewed my notes taken during the interviews for specific details to ensure that I do not overlook relevant information in terms of gestures and observations made and incorporated all data into each transcript. Major themes that emerged from the transcription were further explored. I linked major themes to the conceptual framework and recently published literature as applicable, on successful cost containment strategies specific to ERP implementations within HEIs. Subthemes also emerged in relation to the identified major themes for this study.

Data retrieved from a semistructured interview process can be transcribed, coded, and organized for the researcher to use in the subsequent process of thematic analysis (Castleberry & Nolen, 2018). I used thematic analysis to analyze data collected from participants using open-ended questions during the interview process. Thematic analysis is an approach for extraction of meanings and concepts from data provided in a transcription, notes in the field, pictures, documents, and videos as examples (Castleberry & Nolen, 2018; Javadi & Zarea, 2016). Thematic analysis involves transcription and

identification and analysis of emergent themes (Rosenthal, 2016; Yin, 2018). More specifically, a theme is not necessarily about how often certain words or terms are mentioned, but rather, the researcher's assessment of what themes are most relevant or important to the study (Javadi & Zarea, 2016). The four criteria for thematic analysis are (a) recurrence or iteration, (b) levels for recognizing the theme, (c) emergence from the data, and (d) having an essence nature (Javadi & Zarea, 2016).

Coding of participants' responses must occur prior to thematic analysis to identify emergent themes from the collected data (Swanier, 2016). After I completed the coding of the participants' responses, the emergence of specific themes and similarities among the responses from the interviewees became apparent. Whitehead (2004) for example, conducted a study on the production of quality research and found through a systematic search for alternative themes, that divergent patterns that supported various explanations of data also existed. As with several data analysis techniques, there are potential pitfalls to avoid when performing thematic analysis.

Researchers should not expect to simply regurgitate the data collected without synthesis beyond a specific content to tell the reader what the data content means or may mean (Javadi & Zarea, 2016). An analysis can appear weak or unconvincing if the researcher fails to provide enough examples or extracts for each theme (Javadi & Zarea, 2016). Subthemes often emerge from the set of core themes, which could further support data analysis and add credibility to a researchers' findings (Swanier, 2016). I have acknowledged, analyzed, and synthesized findings of reoccurring subthemes that

emerged as part of the thematic analysis process. The open-ended interview questions were included within the resultant transcription and coding.

Thematic analysis using a data analysis software tool to code and store the collected data was appropriate for my research design. When considering data analysis software, the researcher should determine the type, cost, overall data sources for analysis, the return on investment in terms of value, and potential tradeoffs to achieve value (Woods, Macklin, & Lewis, 2016). The NVivo12 Plus data analysis software is a valid, reliable, user-friendly, and cost-effective tool. While software cannot replace the intellectual labor of qualitative analysis, using the NVivo12 data analysis software to code and store data in a single location is key to analyzing data effectively and efficiently (Houghton et al., 2013; Maher et al., 2018; Swanier, 2016). I used the NVivo12 Plus software in conjunction with Miles and Huberman's (1994) data reduction and data display model to provide a comprehensive analysis about emergent themes and how the resultant data applied to this study.

Reliability and Validity

Sources of data quality issues include the lack of credibility, dependability, confirmability, and transferability in terms of rigorous research (Houghton et al., 2013). While validity and reliability are useful in assessing quantitative research, the most common criteria to assess qualitative research are credibility, dependability, confirmability, and transferability (Houghton et al., 2013; Lincoln & Guba, 1985). Addressing reliability in qualitative research ensures dependability. Likewise, confirmability, credibility, and transferability address validity for qualitative research

(Maher et al., 2018). A qualitative study is reliable and valid when the criteria for credibility, dependability, confirmability, and transferability have been met (Lincoln & Guba, 1985). Within each of these areas, clarification, justification, procedural rigor, sample representativeness, interpretive rigor, reflexive, and evaluative rigor to include transferability, should be achieved (Leung, 2015).

Reliability

Researchers should make known any biases that could impact the study and ensure that findings within the resultant study include measurable results (Morse, 2015). Readers may not always agree with the researcher's interpretation of data but discerning how the researcher determined or interpreted the findings is essential to a rigorous study (Houghton et al., 2013; Koch, 1994). Knowing yourself as a researcher is critical to managing bias (Bernard, 2010). Keeping a diary for the purposes of reflexivity is another way to ensure dependable and reliable data highlights additional thoughts or perspectives of the researcher during the collection of data (Bernard, 2010). A study is trustworthy if the reader can audit the actions, influences, and events of the researcher (Koch, 1994). The audit trail is the maintenance of comprehensive notes related to the contextual background of the study and the reason for all methodological decisions (Houghton et al., 2013).

Dependable data refers to how stable data is within qualitative research studies (Houghton et al., 2013). I used member checking to ensure accuracy of the data collected from participants. Member checking involves the participants as validators in terms of assessing the credibility of the data and results (Smith & McGannon, 2018). To ensure

the information and data collected accurately reflected the participants' responses and resonated with their experiences, I provided my interpretations of the participants' responses to the interview questions throughout the interview process by asking for clarity and reiterating my understanding of responses provided. Participants also had the opportunity to review and replay the audio once the interview was complete. Dependability also means that the process of a study includes enough details that another researcher can sufficiently repeat the same study via an audit trail (Maher et al., 2018; Van den Berg & Struwig, 2017).

Validity

Validity in qualitative research is an assessment of whether the research methodology, design, sampling, data analysis, and results are appropriate for the sample and context (Leung, 2015). A researcher conducting a qualitative study must ensure that the study is valid. A study has construct validity if the resulting inferences can be tied to the conceptual framework of the study (Fusch et al., 2018). Data extraction methods like data triangulation, respondent verification, and documented audit trails of materials and processes can enhance validity (Leung, 2015; Mortensen et. al, 2016). I used a combination of data extraction methods to include methodological data triangulation and documented audit trails of materials where available.

Credibility as a component of ensuring validity refers to addressing the findings from the perspective of the participants (Maher et al., 2018). Some options for enhancing credibility of data are triangulation, member checking of data retrieved, and peer debriefing (Houghton et al., 2013; Smith & McGannon, 2018). Credibility was essential

for this study. Credibility of member checking for example, involves the reporting of outcomes rather than simply performing the procedure of member checking (Birt et al., 2016). I addressed credibility by providing opportunities for the participants to validate my interpretations of their responses in the data collected. The findings or results of the study are credible if participants attest to the accuracy of the data (Smith & McGannon, 2018). Additionally, I provided a document that exhibited a visual display of the major themes and subthemes that directly related to the conceptual framework after the analysis was complete. While some participants took advantage of the opportunity to member check their interpretations of their provided responses after the completion of the interview process; there were other participants who decided that the member checking throughout the interview process was sufficient. I documented participant choices regarding the necessity to conduct subsequent member checking following the completion of the interview process. I also triangulated various sources of available data applicable to information obtained during the interview process.

Confirmability involves neutrality and accuracy of data (Houghton et al., 2013). While the processes for establishing confirmability are like those of dependability, confirmability ensures that any issue described in the findings is not singular but exemplary of a sizeable number of participants (Houghton et al., 2013; Koch, 1994). Comparable to objectivity in quantitative studies, another aim of confirmability in qualitative studies is to minimize researcher bias by outwardly acknowledging predispositions of the researcher (Maher et al., 2018). I recorded my thoughts throughout the course of the research and acknowledged known or developing biases within my

reflexive journal as appropriate. As mentioned previously, I used a consistent interview protocol to negate potential biases related to my own experiences from unintentionally leading or influencing responses from participants. While I have acknowledged that an affinity exists between my current profession and the professions of the participants', I have not served in the capacity of a project director or project manager. Moreover, I sought to gain in-depth, rich, contextual insight regarding cost containment strategies that can be used to support successful ERP implementations in HEIs. Given I had no profound experience in that regard, I welcomed the expert knowledge that the participants shared and helped to fill a gap in knowledge that exists in current literature.

Transferability in a qualitative study is an explanation of how other researchers and readers could make use of the findings (Maher et al., 2018). Transferability is not for the researcher to determine, as the results are not generalizable (Leung, 2015). The researcher's responsibility is to provide detailed descriptions for the reader so that they can make informed decisions about the transferability of the findings to their own specific contexts (Houghton et al., 2013; Maher et al., 2018). I have provided detailed descriptions of the research findings within this study, which may help the reader discern whether the findings are transferable to their own specific contexts.

Researchers should specify an initial analysis sample and a stopping criterion as two main principles when determining saturation (Vasileiou et al., 2018). The targeted population for this study was six HEI project directors. However, I discontinued the interview process after the fifth interview given the stopping criterion of having no new themes emerge from the collected data. Data saturation was achieved. Ultimately, the

achievement of data saturation will determine the final sample size (Fusch & Ness, 2015; Moser & Korstjens, 2018).

Transition and Summary

Section 2 detailed information about the purpose of the study, role of the researcher, participants, research method and design, population and sampling, ethical research, data collection instruments, techniques, organization, analysis, and research reliability and validity. Section 2 also included descriptive information about the semistructured interview process, interview protocol, and consent form for participants. In Section 3, I present the findings of the study, application to professional practice, implications of the findings for social change, recommendations for action, further research, reflections noted throughout the process of the study, and a conclusion.

Section 3: Application to Professional Practice and Implications for Change

Introduction

The purpose of this qualitative multiple case study was to explore strategies that HEI project directors use to contain costs to support a successful ERP implementation on time and within budget. The targeted population included project directors and managers primarily from HEIs and other public organizations located in the state of Washington who have implemented cost containment strategies to support a successful ERP implementation. Four major themes emerged from the data analysis: (a) project governance and PMO, (b) resource allocation, (c) organizational change management, and (d) vendor negotiation. The themes are based on participant views, experiences, and responses to the interview questions regarding cost containment strategies used to support successful ERP implementations.

The results of this study along with Gartner's (2006) IT cost containment framework revealed that project directors and managers use a variety of cost containment strategies to effectively mitigate overruns in costs and project completions to support successful ERP implementations. The findings also included subthemes that emerged in conjunction with the major themes for this study. In this section, I provide (a) a presentation of the findings, (b) application to professional practice, (c) implications for social change, (d) recommendations for action, (e) recommendations for further research, (f) reflections, and (g) a conclusion.

Presentation of the Findings

The overarching research question was: What strategies do HEI project directors use to contain costs during a successful ERP implementation? To answer the research question, I conducted five semistructured interviews with project managers and directors who have used cost containment strategies to support successful ERP and IT implementations within HEIs and a public organization located in the state of Washington. Cases were carefully selected to ensure that insight in alignment with the research question for this study was obtained. As project directors and project managers, each of the participants was responsible for maintaining scope, respective budgets, and timely completion of ERP implementations. To ensure the privacy of the participants, I gave participants pseudonyms: C1, C2, C3, C4, and C5.

According to Gartner (2006), understanding an organization's cost structure and potential for savings involves analyzing IT costs from multiple perspectives, realizing that IT cost containment is a streamlined approach that can mean doing more with less, and using cost containment techniques for reasons beyond saving money. The conceptual framework for this study aligned with the use of cost containment strategies to support a successful ERP implementation in HEIs as more than half of the 25 IT cost containment techniques were evidenced within the findings of this study. Publicly available reports and documents support the methodological triangulation of data collected from the participants and the findings. From the data analysis, four major themes emerged regarding the cost containment strategies used by project directors to support successful

ERP implementations: (a) project governance and PMO, (b) resource allocation, (c) vendor negotiation, and (d) organizational change management.

The subthemes for project governance and PMO were risk management and contingency expense. The subthemes for resource allocation were shared resources and doing more with less. The subthemes for vendor negotiation were vendor–client relationship matters and inclusion of project director or project manager in vendor contract negotiations. The subthemes for organizational change management were (a) transparency and communication, (b) business process reengineering (BPR), and (c) culture. Table 1 shows the major themes, percentage of respondents identifying the theme, and number of instances the theme appeared throughout data collection. Table 2 shows the subthemes, percentage of respondents identifying the theme, and number of instances the theme appeared during data collection.

Table 1

Major Themes, Respondents Identifying the Theme, and Number of Instances

Theme	Respondents identifying the theme	Number of instances
Project governance and project management office	5	33
Resource allocation	5	27
Vendor negotiation	5	24
Organizational change management	5	39

Table 2

Subthemes, Respondents Identifying the Theme, and Number of Instances

Theme	Respondents identifying the theme	Number of instances
Risk management	4	22
Contingency expense	3	3
Shared resources	3	7
Doing more with less	3	6
Include project director or manager in contract negotiations	3	7
Vendor–client relationship matters	4	5
Transparency and communication	5	12
Business process reengineering	3	5
Culture	3	8

Theme 1: Project Governance and Project Management Office

Theme 1 highlights the importance of establishing project governance using a steering committee and having an effective PMO. All participants identified with this theme. Relative to this theme is the integration of cost containment strategies within an organization's project management methodology and practice as supported by project governance bodies (i.e., steering committee, IT governance councils, etc.). The PMO exists to provide organizations a greater likelihood of project success (Philibin & Kaur, 2020). While the level of authority that a PMO may have depends on the organization,

the objectives of a PMO are grounded in the standardization of methodology according to best practices. Expanding upon this, C5 stated:

> Use project management best practices to monitor scope, schedule, and budget for cost. That's been the most successful process that has produced the most number of successes as opposed to other projects that are not really started properly, not given the right considerations upfront, not really knowing what to look for in the next phase or two phases down the road. The concentrated piece is establishing a baseline budget based upon the best estimates at the time and running the project according to that budget.

It is also important to note that vendors and consultants hired to work on project implementations also employ project methodology, best practices, and cost containment strategies. From a vendor perspective, C3 noted:

> Cost containment is buried in every other project management protocol that you are using—requirements traceability, a project charter clearly identifying who is responsible for what and who is working on what deliverable. Being clear and accurate and not low-balling your client's internal cost to support the project in terms of quality resources and quantity of resources. Those are the things that contain costs ultimately. The project management methodologies that are out there and the mature project management things that you do are the things that collectively address cost containment.

An IT governance council or steering committee is a mechanism that can be used to ensure the project does not exceed scope and budget unless warranted. C3 and C5

emphasized the steering committee's role and influence in maintaining cost containment strategies. Constant communication by the PMO and the steering committee about issues or risks that may impact the budget and scope of requirements to all stakeholders is imperative to project success. Both participants affirmed that a major function of the steering committee or an IT governance structure is to have discussions about how issues are escalated, renegotiated, and resolved and whether additional scope to current requirements should be approved.

Conversely, the absence of an effective steering committee or IT governance council within HEIs may cause projects to lose competitive advantage, sustain ill-alignment of IT and business objectives, and potentially obstruct developing projects, organizational performance, quality of services, management of operations, and costs resulting in failed implementations (Ratshitanga, Ochara, & Kadyamatimba, 2019). C1, C2, and C3 had similar responses and addressed cost containment strategies from a risk management perspective and options for contingency expense use if needed.

Table 3

Project Governance and PMO Subthemes

Theme	Frequency of occurrence	Percentage of occurrence
Risk management	4	80%
Contingency expense	3	60%

Risk management. The first subtheme under project governance and PMO is risk management. Risk management was identified by C1, C2, C3, and C5 as an essential

element of cost containment strategy. The participants also shared risk management strategies and tools used to contain costs in support of successful ERP and IT implementations.

C1 had a risk management team representing different functions of the organization. C1 acknowledged, “We looked at costs from a risk perspective. We realized that if some of these risks actually turned into issues and the issues materialized, [the] issues would cost us a bunch of money that we weren’t planning on.” C5 added, “Risk happens in both directions. It can be a good outcome or could be a bad outcome. With risk management and project management I tend to look at project management primarily as risk management.” C3 asserted,

> Cost containment is driven in two ways. One is by the scope of what you commit to deliver. The second is how efficiently you are going to manage to be able to deliver those. Because if you take too long and too many hours to get something done because of inefficiency, issues on how the progress is being managed [could cause] costs to go up. So, cost containment is done by preventing scope creep that is not paid for. And by requirements traceability. So, you define upfront the scope of what you are going to do and how it is going to be done. You basically define that by very detailed requirements that are signed off [agreed to] and links to the deliverables that you are going to deliver over a timeline.

Risk management strategies. Whether a project succeeds or fails can depend on strategies used to help minimize risk (Fayaz et al., 2017). C1, C2, C3, and C5 expressed the need to prioritize visibility of risk at all levels of the organization, the importance of

understanding the difference between risks and issues, and the ability to address said risks by conducting risk analyses and applying mitigation strategies as necessary. C1 emphasized the need to prioritize risks and to make them visible at the highest echelons to ensure transparency and awareness. More specifically, C2 noted,

> We worked with our vice president to create a policy that [basically said] we are all going to use the same thing. And we are all going to use it more or less the same way. We included some policy decisions as part of a broader policy. So, one way [risks were mitigated] were through standardization. It is about presenting a unified front.

C5 mentioned, "We define a risk different from an issue, right? So, we looked at risk as a potential event, somewhere down the road that could positively or negatively affect a project." C5 also provided further clarification by adding, "A legislative decision is a good example. Legislative session is coming up next year in January, they may allocate funds for us, they may not. We identify that as a risk, and we do it formally." An issue on the other hand is immediate as C5 responded, "An issue is something that's on our doorstep right now. It is affecting the project. It is in our face. We have to deal with that issue now as opposed to something we think might happen down the road."

Participant C3 pointed out that timing is of the essence regarding risks, "Sometimes when risks happen, it is too late for it not to have some cost impact, because it takes time for you to react. Sometimes the solution is risk mitigation. It's not risk avoidance." C3 also noted that actualization of risks always involves costs and how much costs often depends on how fast a project director or project manager can react to

mitigate the risk. Assigning the right resources to mitigate known risks and backfilling those resources as appropriate is key.

C5 concluded:

> We use three mitigation accepted strategies, accept the risk, mitigate the risk, or transfer the risk. If we accept the risk, we simply wait and see that happens and if it does not go our way, then we figure it out. Or we mitigate the risk by devising a plan to start setting aside available reserves should the risk have potential negative impact on our budget. The third option is to transfer the risk. As an example, if we have a software development project and experience a risk because we have a shortage of software developers [because] they are all working on multiple projects. They are all getting pulled from project to project causing confusion. That is a risk for us. We can say, well, let us transfer that risk. Let us hire a contractor. So effectively, we transfer the responsibility of the risk to the contract.

Risk management tool. Several participants used risk management tools. While C1 emphasized the extensive use of a risk management tool, "I did a lot of tracking of risks." C3 and C5 were more explicit in their explanation of how risk management tools should be successfully used to support implementations.

C3 explained, "What you need to have if people should have an issue is a resolution management process. Issues of any kind on the project should be logged into a database and never disappear."

Consistent with participant C1 and C3; participant C5 also monitored risks. C5 stated, "We run risk registers for every project. It's the job of the project manager to

collect and monitor risks that are going to threaten the project." While the project manager has the overall responsibility to manage risks, C5 also affirmed, "Anybody can raise a risk, and we log that risk."

Contingency expense. The second subtheme under project governance and PMO is contingency expense. Three participants shared three different approaches to address contingent expenses. While each approach varied, their project timelines were nonnegotiable and their commitment to stay within budget was consistent. C5 used a more common strategy of including contingency expense as a line item in the budget. C5 shared:

> Any budget that we build, we build in a contingency. Anywhere between 10% to 15% generally is what we would build in and that kind of lines up with that idea of progressive elaboration. We know that there's going be changes, let's put a set-aside for the budget so that if we do decide that we're going to add more money, it's already there. We do not have to actually go and find dollars. That is the reason to expense it upfront.

Alternatively, C2 revealed, "One of the things that we have not done is set aside a contingency budget." C2 and the project team managed to support and prioritize contingent work by associating out of scope requests with other HEI initiatives. C2 further explained:

> One of the approaches we have taken is getting funding for implementation work through other initiatives or associating a request with other initiatives. Particularly, if we are talking about how faculty will use it [the implemented

> system] to involve advisors in students' lives, who may be going through some academic challenges… well, that's part of our retention initiatives. So, it should be funded as part of our retention initiatives. Trying to be creative about where we can get funding for contingent work. We were able to very much limit contingent cost.

C4 used two different strategies to address contingent expense. According to C4, determining which strategy to use is dependent on whether the contingency is related to a deliverable that is in scope or not. C4 clarified:

> So, the out of scope things, we just said, "We will put them in a parking lot or a backlog. We have a limited scope for this rollout." We wanted to make sure that we do the baseline for the rollout and not say no to them, but later. Let us get the rollout completed. We stuck to that.

On the same project, C4 experienced a major shift in the schedule that included an additional deployment group unexpectedly. The shift resulted in an increase of work without an increase in funds to support the contingent development work needed. Despite the late addition, the deployment group was a project scope deliverable. Having a finite budget, C4 was able to heavily rely on their contracted vendor services for the development work. C4 also had to re-strategize to ensure money was available for the additional development hours needed. C4 asserted:

> I had to really shift the plan. We were able to implement. We did end up having a lot of custom development for that last deployment, but we had

> reserved the budget for that, and we were able to use it at the end. For a major or large deployment group, we expect X amount of dollars because larger deployment groups typically require more customization. We were left with about 300 hours out of a couple thousand hours of development. We estimated and allocated the budget, but overall, we had the flexibility to move funds back and forth. So, that was some of the planning.

Correlations with peer-reviewed studies. While literature remains limited regarding IT governance within HEIs, prior research has shown that IT governance is imperative to realizing IT business value (Ratshitanga et al., 2019). The participants within this study strongly supported the establishment of a PMO and emphasized the importance of having a governance structure in place to make and enforce decisions when needed that are beyond scope or budget. Project governance is a body of stakeholders that typically exists at a higher level than PMO and is charged with making project management system decisions in a manner that is congruent to project objectives and stakeholder interests (Musawir, Abd-Karim, & Mohd-Danuri, 2020; PMI, 2017). C5 noted that when there are decisions that must be made that are not included in the approved budget or scope, the steering committee are, "…the ones that need to determine what they are willing to accept, define, or decide, and where the money is going to come from." There are three types of PMOs according to the Project Management Body of Knowledge (PMBOK): (a) supportive (advisory in nature), (b) controlling (providing governance), and (c) directive (advises, provides governance, and resource allocation) (Philibin & Kaur, 2020; PMI, 2017). Inferred from the data collected, a directive PMO

was preferred as participants received direct support in terms of guidance, resource allocation when possible, and were given the flexibility to make local decisions within the project scope and budget, yet deferred to a strong steering committee to make decisions on issues or risks that exceeded scope or budget.

Current literature has also shown that organizations that have a formal risk management team during ERP implementation are more successful at monetizing the value of their ERP expense via improved financial performance than organizations without a formal risk management team (Garg & Khurana, 2017; Ghobakhloo, Azar, & Tang, 2019; Tian & Xu, 2015). While each participant provided data relative to their unique experiences, the results of this study revealed an overall shared perception by the participants about risk from a cost perspective. Moreover, the need for a risk management team, a risk tracking mechanism, and effective risk mitigation strategies during project implementation were highly regarded. Project governance and PMO models vary depending on the context of the project. However, the participants' responses specific to the significance of an effective steering committee and PMO aligns with Loch, Mahring, and Sommer's (2017) conclusion that a steering committee is crucial for strategic projects and should have the power to make decisions in a timely manner. If the steering committee has no authority to make decisions, another label commiserate to project coordination groups for example, should be used instead to accurately reflect the committee's purpose (McGrath & Whitty, 2019).

Project directors and managers should be experienced enough to control and monitor ERP implementation processes as well as the budget toward limiting risk

exposure to the project (Garg & Khurana, 2017). Understanding that mitigation of a risk may not always be feasible, some participants noted that it is not only prudent, but also a common practice to build contingency expense into the project budget. Setting aside contingency expense or risk reserves as a line item in the project budget is a common practice and often calculated based on performed risk analyses (Brunet, 2019). As noted within the discussion on contingency expense, participants were determined to find and communicate innovative and often creative ways to manage unforeseen circumstances relative to cost containment without negotiating project completion times or the stated budget, unless approved to do so by the steering committee as a last resort.

Correlations with the conceptual framework. The first step in Gartner's (2006) framework involves comprehension of cost structure and savings potential. While the framework posited that CIOs who understand their IT cost structure and cost drivers are more apt to develop plans that can deliver continuous savings (Gartner, 2006), this study revealed the same can be true of project directors and managers, vendors, and consultants who implement ERP and IT implementations within HEIs. In alignment with Gartner's (2006) framework, the data collected regarding project governance, PMO, risk management, and contingency expense were from participants who have successfully analyzed IT costs from multiple perspectives. The collective project management experience of all the participants exceed 50+ years, with 25+ years within HEIs. Each participant has served in one or more of these roles within the last five years: project director, project manager, consultant, or contractor.

Creating an IT PMO to improve project, program, and portfolio performance is the second technique in Gartner's (2006) framework. Establishing an IT governance council to improve prioritization and investment decisions is the third technique (Gartner, 2006). Both techniques are categorically associated with costs linked to demand in Gartner's (2006) framework. Project governance and PMO emerged as a major theme in this study given the consistent language used, yet distinctly unique experiences revealed by each participant. The participants' unique experiences relative to project management methodology and cost containment strategies have shaped their perspectives and increased their capacity to manage demand to effectively support successful ERP and IT implementations.

Theme 2: Resource Allocation

Theme 2 is specific to how resources applicable to time, money, materials, and most often people are allocated during IT and ERP implementations. All participants identified this theme as a critical component of their cost containment strategies. Two subthemes, shared resources and doing more with less, were also prominent. Table 4 shows the subthemes, frequency, and percentage of occurrence. While each of the participants incurred barriers with attracting, acquiring, or retaining resources needed, they each agreed that attaining the right balance of project and organizational resources is key to a successful implementation.

Large (multiple business unit) ERP and IT implementations often require additional development expertise for potential customizations. C4 noted, "For each release we allocated high-level estimates given larger units require more customization

and we wanted to allocate [resources] for those considerations." Likewise, C1 affirmed, "The majority of our budget was based on resources needed." Although staffing expense made up a significant portion of the budget C1 mentioned, "There were times when because we didn't have the resources, and people had their day-to-day jobs, it was very difficult for them to maintain."

Given organizational resources are usually tasked with preparing for the implementation and effectively managing their day-to-day jobs simultaneously, HEI leaders and project staff are faced with the complexities of determining the most effective way to maneuver staffing, logistics, training, and other activities that occur during implementation. Addressing logistics, staffing, and knowledge sharing among users, C1 offered the following suggestion, "Streamlining the workshops and leveraging sister colleges [in terms of travel and operational space] is an opportunity to mitigate costs." In HEIs, changes in rules, policies, and guidelines external to the project team can have budgetary and scope implications for a project implementation. C4 was able to balance the goal of cost containment and meet external expectations, while efficiently streamlining the need for additional resources. C4 shared:

> One of the cost containment strategies involved an implementation guideline or suggestion to have a separate project manager for each college [within our district]. When we were thinking about this, we were like, "We're going to have project managers or three - how would that work?" We decided to hire one person per pillar. Each person would really just focus on each pillar [CS, Finance, HCM] and how the implementation would take place for all three colleges [within the

> district]. That is a really effective cost containment strategy because it allows you to have one person to do focused work on those [specific] processes, local explanations, and coordination. It has been much more successful than how we would have been with four different project managers.

While determining resource allocation is a pre-implementation task, an inaccurate estimate of costs associated with resource allocation can have consequential impacts during the implementation phase. C5 reiterated:

> It ties back to how you start a project because a lot of times, what we see is projects getting started with no sense of the resources. Then during the project, you realize, okay, we need technical, or we need more developers. And usually when that happens, it is an indication of how the project was started. And it brings things to a halt until you can get new resources. In the world that I have worked in with state government, often those resources never show up. It is more of we understand your needs and we know it's hurting the project, we don't have the ability to give you more resources, so, just do what you can with what you've got. And then usually something else has to give.

C3 provided insight from the perspective of a vendor contracted to work on a project within an HEI. C3 addressed the challenges of offshore outsourcing, potential staff reconfiguration, and selectively outsourcing noncore functions for cost and service advantages; all techniques that are also represented in Gartner's (2006) framework. C3 explained:

> With a consulting company, you have got to be able to track your resources and their costs. Typically, the standard cost because consultant companies share resources across practices and across projects. So, you have a standard cost per hour for your resources. They log time to that project. Well, the two ways to address the cost is how do I increase productivity right from the resources? So, having your resources decide to or incentivizing your resources to be local so they can work 5 full days a week, rather than showing up at 11 o'clock on Monday morning and leaving on Thursdays at 3 [because they live in other states]. Having as much as possible your project team be local is one way the project team can contribute to reducing cost by increasing productivity because instead of traveling, they are working. Instead of getting burnt out by being on the road, they are working.

C3 further stated, "You could allow your project team to work remotely whenever possible, especially your development team if they're just doing configuration work." C3 expressed a need to assure the client that productivity does not suffer if a portion of the team works remotely. C3 noted:

> Your team and you [as the PM] want to be able to work with your clients and convince them that when you're doing those kinds of things [development and configuration] that don't require face to face time, it is better to let them work from home. The [initial] strategy may have been to have everybody here all day long, all week, even though they are just configuring the solution. They could have been doing that from home. The whole team does not need to be here all the

> time. That is the biggest way to leverage productivity because most of these people have to travel.

The value of this data highlights the significant amount of down time that is lost in productivity due to project team member travel. C3 had a mixed opinion about offshore outsourcing, but acknowledged that selective sourcing as part of a cost reduction strategy should be considered:

> Offshore development. A lot of the big companies have offshore developers in India because of the lower cost. And they're [vendors] competing on price with the level of service you get from offshore, the level of quality of the resources, and the difficulty of managing when they're up at night and you are up in the day. There is no real time interaction between the two teams [offshore and project team], except for the trade off in the morning of what your guys achieved last night. [There are also] the administrative difficulties of keeping those two teams in sync—real time with each other. The cultural barrier between the way that they work over there and think their doing a good job and what you think is a good job is different in teaming and communication.

Favoring a mix or selective outsourcing over complete offshore development, C3 suggested that project directors and managers should employ lead developers to work onsite and use a junior team to do work offshore. While C3 noted that this is a cost reduction strategy, C3 also warned that with this strategy it is much more challenging to deliver a quality product.

Shared resources and doing more with less were subthemes that emerged from the greater conversation of resource allocation. The rich, contextualized data regarding these subthemes are specific to each participant's experience, yet each participant exhibited a firm understanding of the sacrifices required to complete the project implementation on time and within budget.

Table 4

Resource Allocation Subthemes

Theme	Frequency of occurrence	Percentage of occurrence
Shared resources	3	60%
Doing more with less	3	60%

Shared resources. Three participants expressed a shared desire from the perspective of the project team and organizational leadership to collaboratively establish cost saving measures where possible. The cost containment strategy for C1 and C2 was more proactive rather than the consequential approach to cost containment strategy of C4. C1 shared, "My salary came 50% from the implementation team, and 50% from the college. The person that I reported to - only 50% of my salary came from his budget. The other came from the implementation team's budget." C2 used cost and efficiency as variables to consider how best to allocate resources within their district which included three different college campuses. C2 explained how this decision was deliberated:

> We looked at, do we want to have one person at each college, a system administrator, and then divide the cost of that term for potential increases in pay

> or job duties or needing to reassign tasks, or do we want to have one district system administrator who will work with different stakeholders at each college and kind of create a local user community? We chose to have one person at our district office. A trainer who coordinates the user community. Both of those were effective cost saving measures.

It is also keen to note that resource allocation may fluctuate throughout the various stages of project implementation. C1 stated:

> The cost containment strategy [in terms of resources] was to hire project managers [from another college] on a part time basis, 20 hours a week to get through the last couple of weeks of the project [to backfill full time employees that rolled off the project]. So that saved the college a lot of money in doing that.

Circumstances discovered after a project implementation has commenced may require a different approach to resource allocation, especially if it concerns an expected deliverable from the project team. C4 reflected on a recent experience:

> When it comes to resources, we did end up underestimating the number of developers that we needed. We did not anticipate the need for developers to do reporting because we really did not have a good understanding of the product and its capabilities. So, this product came and [I thought] our developers could do the development of the report [but], the out of the box reporting capability was not meeting the need. So, that was a note and surprise. As we started rolling out, the customers were like, “Okay, what about all the reporting that we needed?” We responded with, “We need developers that can come in and do the additional

> work." But there was no resource plan to have all that resource allocated. So, we really had to cover [that work] or they [our clients – the organization] were going to have to provide resources. They were able to shuffle internal resources and get them to the project. They made procuring resources their highest priority for the project. So, we got to pull resources from other areas to support the project.

Doing more with less. The other subtheme under resource allocation was doing more with less. Three of the participants discussed the reality of limited resources and their approach to maintaining the implementation schedule, cost containment strategy, and how they managed the human cost in terms of excess work to attain project milestones, when applicable. C1 addressed how attrition can erode the morale of the team if the remaining work exceeds the resources needed. C1 affirmed:

> There was attrition as people left. I feel like the biggest thing is that the team felt overworked. We talked about the potential to work overtime. We had a couple people on the team that worked overtime, consistently 60-70 hours a week, kind of overtime. We had some people on the team that worked no overtime. So, I feel like people did what they needed to do and what they were willing to do to get the work done because we knew we were not going to get any additional resources to do the work.

C1 also shared that while the funds to hire additional resources were not available, deadlines were met despite periodic subpar results. Doing more with less attributed to a cost savings for the project, even though morale suffered occasionally because of it. C1 concluded, "The good thing is that people believed

> in the project enough and wanted to get to the other side that they were willing to go through that and they knew it was not going to be easy."

While C4 had the flexibility to attain additional resources, the replacements were rarely an equivalent resource gained. Citing that the project team had to "jump through some hoops" to complete their work, C4s project team remained committed to completing the project on time as the timeline was, "nonnegotiable."

C2 highlighted the need to assess current resources to creatively position resources from a cost containment and time efficient perspective when resources are limited. C2 specified:

> We have three colleges, [with] three versions of the dynamic class schedule, and the course catalog. One of the ways that we have tried to minimize the cost of Campus Solutions implementations [with] three local configuration assignments is to have one person to draft all three [configurations] and then just have them be reviewed by the stakeholders in each college. That has been a really effective strategy for us, and our folks have really embraced that. So our project team, as they are looking at cost containment, their focus is, "Is there something I can do with my technical expertise that will save the time of our registrar and of our financial aid director so that they can spend less time mashing together spreadsheets and more time reviewing, but also more time focused on their students?" From that perspective, we save the time of our key stakeholders and lowered costs that way.

Despite varied circumstances, each of these participants expressed that while doing more with less can be challenging, the goal and purpose of the project implementation should be kept at the forefront. Moreover, how the team addresses this barrier can be a determinant of success.

Correlations with peer-reviewed studies. Findings regarding resource allocation tie to existing literature as participants overwhelmingly found that adherence to the project implementation budget and schedule was highly contingent on PMOs ability to strategically align, attain, and retain resources understanding that the alternative was doing more with less. While end users of the ERP system may not have direct concern about the implementation budget or schedule, existing literature shows that end users also agree that adequate allocation of resources during implementation is key to meeting organizational objectives and realization of IT benefit (Reitsma & Hilletofth, 2018). Beyond adequate allocation of resources is the attainment of the right balance of project and organizational resources for a successful implementation. C4 noted the importance of having a resource plan prior to implementation that covers the known projections and a strategy for managing contingent resources if needed.

Sharing organizational and project resources as discussed by C1, C2, and C4 can influence positive outcomes that are both tangible and intangible. The tangible outcomes are specific to cost savings measures. C2 implemented a train the trainer approach rather than to hire external resources to coordinate and facilitate transfer of knowledge and ease of transition to the new system for end users. Using this approach saved the HEI additional costs in training expense.

From an intangible perspective, the train-the-trainer approach is most effective when the trainer is a subject matter expert (SME) committed to ensuring that the end users take advantage of every opportunity available to test and navigate the system prior to deployment. Moreover, there is an inherent trust factor that exists when the trainer is a highly regarded internal resource (Zhu, Wang, Yu, Muller, & Sun, 2019). Taking the initiative, C1 became certified in Prosci training as a project and organizational change manager. By training HEI leaders and first line managers on change management best practices, not only were costs related to necessary training severely reduced, but the ROI in C1's training was realized throughout the organization as OCM methods were deployed throughout ERP implementation. In alignment with other studies, C4 shared that staying within budget and schedule may require that ability to procure internal organizational resources during implementation as the procurement of external resources for extenuating circumstances can be costly (Sundqvist, 2019; Veres et al., 2019). The intangible outcomes involve knowledge transfer regarding ERP system functionality, creation of streamlined BPRs, and integrated system capability that allows for increased organizational communication and decision making in real time.

The subtheme doing more with less emerged as participants discussed managing project implementations with less than optimal resources. While each of the participants experienced a lack of sufficient resources at different times during implementation, impact of attrition was reduced by using a combination of effective cost containment measures, shared resources when possible, and streamlining tasks. While attrition of resources may lead to a reduction in costs, it is important to note that attrition should be

kept as low as possible to negate over-runs of the project schedule (Garg & Khurana, 2017). C1 and C2 respectively emphasized that motivating factors to complete the project on time despite optimal resources were, “people believed in the project enough and wanted to get to the other side,” and that “the timeline is nonnegotiable.” The findings in a recent study showed that project team members are willing to take risks and make individual sacrifices when there is a working relationship between the PM and team members where high levels of trust, open communication, knowledge transfer, and cross-functional coordination exists (Zhu et al., 2019). The findings substantiated the participants in this study shared similar experiences.

Correlations with the conceptual framework. There were several cost containment techniques from Gartner’s (2006) framework that emerged in the collected data. Gartner (2006) proposed staff reconfiguration, selective outsourcing, offshore outsourcing, and automated software distribution as potential cost containment techniques to reduce labor costs. As a project manager for a vendor, C3 effectively optimized staff reconfiguration and selective outsourcing as cost containment techniques to reduce labor costs. However, C3 experienced several challenges with offshore outsourcing.

Gartner’s (2006) framework clearly states IT cost containment means doing more with less and that IT costs should be analyzed from various perspectives. C4 acknowledged the necessity of having a resource plan and ensuring the appropriate individuals (e.g., vendors, PMO, developers, etc.) are involved in the development of the plan to accurately allocate and estimate the cost of project resources. It is also essential to

effectively communicate resources' status and monitor and analyze the cost containment strategy in relation to resources required for the duration of the project implementation in alignment with strategic organizational initiatives and objectives. C2 was able to effectively reconfigure staff resources that met both goals of cost containment and efficiency because the plan was embraced by stakeholders who had the most to benefit from it. C4 was able to garner additional developer support from resources within the organization due to a shared commitment to complete the project within budget and on time. While C1 did not receive additional resources as needed, the PM's salary expense was split between the project and the HEI as the PM served in dual roles which resulted in costs savings that benefited the organization and project equally. Each of these cost containment strategies would not have garnered the same results if key stakeholders from the HEI, vendors, consultants, SMEs, steering committee, and project team were not thoroughly abreast of the cost containment measures required to remain in alignment with organizational objectives toward realization of IT benefit and value. The stated findings coincide with Gartner's (2006) framework as it also indicates that the value of instituting cost containment techniques extend beyond saving money.

Theme 3: Vendor Negotiation

Theme 3 was vendor negotiation. All five of the participants identified vendor negotiation as essential to realizing a successful ERP and IT implementation. Relative to the research question, the data collected disclosed choosing the proper cost containment technique(s) to implement should begin prior to implementation and before the vendor is selected. Vendor–client relationship matters and including the project director or manager

in contract negotiations emerged as two subthemes associated with vendor negotiation. Table 5 shows the subthemes, frequency, and percentage of occurrence.

C1 summarized vendor negotiation in simple terms, “You get what you pay for.” Considering the length of time involved with implementations, ERP vendor reputation should be a key consideration when deciding the right vendor to partner with (Alaskari, Pinedo-Cuenca, & Ahmad, 2019). Conveying the need to prioritize a vendor’s track record over cost, C1 further elaborated by saying, “…spending a little bit more money ahead of time could save millions of dollars later [as compared to] an implementation that took two or three times the amount or length of time to complete.” Choosing the right vendor for an ERP or IT implementation involves asking questions of the vendor(s) to determine fit for the project which includes learning about their processes and their ability to work with an HEI or organizational project team. C5 discussed the type of questions to inquire of the vendor:

> We would want to know, what are your software development processes? And how are they going to integrate with our need for information? As an example, “If you’re doing an Agile process and you’re using Scrum as a tool for doing your daily stand ups, we want to be involved in this.” Status reporting is another way of embedding people in the project, whether we embed developers or contractors in our site, or we send a link to their site. Those would be things that we definitely want to deal with upfront. If you have not dealt with it upfront, when it becomes a problem, it becomes a big problem because you do not know what the problem is until it is already impacting.

Successful negotiation requires a firm comprehension of what gaps, if any, exist regarding service requirements or known barriers to achieving project deliverables prior to implementation. C2 recalled:

> One of the things with data from implementations that we were focused on was configuration instances that needed more customization at the code level. As an example, one piece of this was a technical integration and we negotiated with the consultant to have them provide training on the technical integration without charging us extra for it.

Understanding that negotiation involves two or more parties, negotiation from a vendor or consultant perspective involves clearly defined requirements, responsibilities, and effective communication to stay within the confines of the service agreement. C3 surmised, "The whole project is a negotiation." As part of contract negotiation, functional support requirements, new developments, and any deliverables where compromises are made that could extend functionality or project timelines should be established in writing (Paredes & Carvalho, 2019). If additional scope or deliverables other than what was initially agreed upon are required, C3 contended:

> One thing you [vendor or consultant] will have zero tolerance for is scope creep for additional functionality beyond the stated requirements, unless approval for additional requirements, or additional costs to achieve those requirements are agreed to by the steering committee.

Determining whether a vendor is the best fit for the project means that the vendor must be able to navigate the context, environment, and parameters of which the HEI or

organization operates within. C5 provided an example about contract development on a project for a state organization:

> Any time you are talking about how things get done in the state, you have to consider the environment or the context. From what I have seen, we have contracts people in our agency with limited experience in writing contracts, which is an issue. You have your contracts department who is used to writing general language contracts, but not often used to writing IT contracts. You have a business department who is focused on the business outcomes, but they are not really versed or knowledgeable about the process of developing software or implementing a software as a service platform. The limitation of their experience in writing IT contracts in particular tends to be an issue.

Vendor negotiation surpasses the development and formalities of the contract. Services provided by the vendor can assist organizations with their desire to integrate their internal resources with the external knowledge of the vendor, which has positive implications on the development, implementation, and ongoing maintenance of the ERP system (Niu, Chen, Huang, Li, & Chen, 2017). As C4 concluded, “When relying on a vendor, we are talking about implementing a product that we have no expertise or understanding. During the negotiations, you’re relying on the vendor to help plan the rollout schedule - they [should] help you plan.”

Table 5

Vendor Negotiation Subthemes

Theme	Frequency of occurrence	Percentage of occurrence
Vendor–client relationship matters	4	80%
Include project director or PM in vendor contract negotiations	3	60%

Vendor–client relationship matters. The first subtheme under vendor negotiation is vendor–client relationship matters. Four participants cited the importance of developing and maintaining an open, trusting, and effective communication plan with the vendor from the start of the implementation until the project is complete. Understanding a vendor's project methodology and approach to client relationships is critical as the key to vendor satisfaction is a relationship that can be trusted (Panorama Consulting, 2019). C3 and C4 spoke about having a positive vendor–client relationship as it was paramount in determining scope, responsibility, and budget estimations. From the perspective of a vendor, C3 affirmed, "You agree with your client up front. That is how you communicate cost containment to your client." C3 further asserted:

> A lot of times, you actually present your team upfront before the proposal - before the project is won. You make a commitment that this will be the team on the project. The contract is going to say that you can swap out resources, but there is an implied commitment that you are going to do everything within your power to get these particular people on the project. Otherwise it is viewed as bait and

> switch and when something like that happens, trust is extremely affected. If you are going to swap, the lead project manager will have vetted your new project manager for example, with the client. Even if it is not contractual, it is a relationship requirement.

Similarly, from an organizational PM or client perspective, C4 addressed the need to sufficiently engage with the vendor to collaboratively determine the work needed based on the selected product. C4 acknowledged the expertise of the vendor, expected direct support, and advice concerning estimations, system capabilities, and comprehension of the level of complexity to accomplish planned deliverables. C4 articulated:

> Vendors who are looking at your [request for proposal] RFP and the requirements are usually [looking] at a high level and broad. To the extent possible, work with them and go through some of the detail where you are not clear about the product and its capabilities. It is about having those conversations [regarding] how we want to get this right. There are some political areas where we really may have to invest in. Our customer constituents are very much interested in those, let the vendor know that these are our concerns. Have those conversations and make sure that they take those things into consideration when helping you. Vendors were very supportive. I think that is where the partnership with the vendor basically made a difference.

Even in disagreements about best practices, working with the vendor to manage expectations and desired results is key. As C2 noted:

> It was really about disagreements between what the vendor thought the best practice was. Well, we thought the best practice was how we use the tool. In some cases, we worked with them to redesign some parts of how they thought we should be set up in their environment. We worked very hard to be on very good terms with their consultant and they ended up doing some amount of work for free for us.

Highlighting the consequence of inadequate vendor selection and a deficient vendor–client relationship, C5 concluded:

> The other piece that we've seen is when we have a vendor involved who is the problem and we have not written our contracts well enough to deal with a vendor that is not delivering or not performing the way they should be. However, we do not realize there is a problem until they do not deliver. What you end up doing is contract negotiation after the contract has been signed. Never a good thing.

Include project director or manager in vendor contract negotiations. The second subtheme associated with vendor negotiations is include project director or manager in vendor contract negotiations. C2, C3, and C5 were explicit in their depictions of why it is necessary to include the project director or manager at the onset of vendor contract negotiations. C2 and C5 shared how they contended with vendor contract negotiations that often took place before the assignment of a project director or manager. C2 detailed:

> I was brought in as the project director after the definition of requirements, the service contract, and decision. The project entailed technical integrations,

> configuration work, and then lots and lots of business process alignment, particularly with the input of our counselors, our advisors, and our instructors. We set aside a project budget that really focused on implementation and technical work. I underestimated how much alignment we would need to build and [the associated] business processes that had not existed prior to the purchase of the system. I had been under the impression that the people knew what they were buying and that they were buying the system that they wanted to use. They definitely wanted [what the system could do] but, they had not really thought it through. So, we had to go back and say, "Hey, we need money to pay faculty to sit in workshops and talk and argue about how they will actually use the system on a day to day basis in their classroom." You have asked us to automate a business process that you have not standardized or defined, we need to first put in a lot of time to define and standardize that process. So, [with regard to cost containment strategy] one of the approaches we took is, there is a project budget, we must stay within that.

C5 conveyed, "When an RFP is put together, often the project manager isn't on staff or isn't on the project." The absence of a knowledgeable and experienced IT project director or manager during the vendor selection process and vendor contract negotiation could mean that potential risks go unnoticed and do not become illuminated until project implementation has commenced. If given the option to participate in vendor selection C5 emphasized the need for project directors and managers to ask direct questions related to project methodology and software development. C5 specified:

> Ideally, you would have generalized language in the RFP that says the apparent leading successful vendor will need to work with the agency for gaining or providing insight into the development process. With the vendor interviews that go on - you would ask, "Do you do a waterfall or an Agile type project management process?" Then say, "We do Agile, here's what our expectations are. How can you make sure that those are met?" Also ask, "What are you going to use for tougher development?" Even your most basic COTS involve having to build some sort of an interface for it to work with other applications within the agency. There is always some sort of software development and just clarify that upfront.

Similarly, from a consultant and vendor perspective, C3 expressed the need to clarify expectations upfront. C3 asserted, "In any project plan, you've got to define what it is that needs to get done in total and identify what the client's responsibilities, tasks, and deliverables are, and what yours are [as the vendor]." Providing a similar example as C5, C3 further elaborated, "Most [clients] are going to want an interface, bringing over X, rather than to have to enter data manually. That should be included in the contract. If we did not agree to that, we didn't price it." C3 concluded, "The cost containment on that is we can do that for you, but here's what it's going to cost."

If project managers who use cost containment strategies as a common practice are included in the negotiation of the contract with the vendor prior to implementation, the potential to garner costs savings at the forefront of the project is greater. C2's experience exemplified this concept:

> Having one instance [versus 3 separate applications] in one process allowed us to streamline some things. We were presented with an offer from the vendor to have them support this [scheduling initiative] as three separate colleges for $100,000. We said, "No, we're not going to do that." We renegotiated a separate agreement, where they would implement us in one instance in one implementation process for $60,000. Oh, that was a big savings.

Correlations with peer-reviewed studies. There are at least three common attributes for evaluating an ERP vendor (a) supplying ongoing service, (b) providing sufficient technical capability, and (c) having a good reputation (Czekster, Webber, Jandrey, & Marcon, 2019; Niu et al., 2017). Eighty percent of the total participants in this study indicated that vendor–client relationship matters in terms of a successful project implementation. Collaboration between ERP vendors and clients is essential and should be recognized by both parties (Mahmood, Khan, & Bokhari, 2019; Sundqvist, 2019). If there is a trusted partnership between client and vendor as C3 and C4 conveyed, efficiency in project methodology increases and communication is enhanced to include a shared commitment in attaining organizational objectives. Participants C2, C4, and C5 noted how working with vendors and consultants who had extensive technical expertise positively impacted their capacity as project directors and managers to support successful project implementations. C1 insisted that reputation of the vendor should be a priority over cost and from a vendor perspective, C3 concurred by acknowledging that beyond contractual formalities, a key factor is relationship management between client and vendor which could positively or negatively impact vendor reputation.

Project managers are often evaluated on their ability to complete a project based on scope, budget, and time; also known as the triple constraint (Sundqvist, 2019). Having an experienced project director or manager to ask pertinent questions about a vendor's methodology, communication plan, development specifications, and other criteria or concerns during the RFP process or prior to vendor contract negotiation maximizes their ability to optimize resources, assess potential risks, and provide a comprehensive foundation to build upon. HEIs whether small or large must navigate increasingly complex accountability environments and are monitored accordingly (Brown, 2018). Assigning a project director or manager to a project during the development of the RFP or prior to vendor contract negotiation is imperative.

Although each participant's project implementation was unique, their collective experiences and challenges regarding inept contracts or the need to renegotiate scope due to the inheritance of a contractual agreement after negotiation were consistent. As the participants in this study revealed, involving a project director or manager after the vendor has been chosen and the contract has been negotiated can potentially expose the project to rework during the implementation phase. Project managers and directors implementing ERP systems in HEIs must be prepared to maximize stakeholder value beyond the triple constraint (Niu et al., 2017; Sundqvist, 2019; Veres et al., 2019). The participants in this study shared a common understanding about the advantages of including a project director or manager in the process of contract negotiation.

Organizations that fail to invest in determining the ERP requirements definition prior to selecting software experience budget and timeline overruns and low realization of

IT benefits (Panorama 2019). The data collected affirmed project directors and managers are pivotal in their roles and if provided the opportunity to participate in the development of the RFP, assess potential vendors, and engage with vendors throughout the contract negotiation process, the potential risk of cost over-runs or exceeding project completion times may decrease. Moreover, the project director and manager as key stakeholders would also have more time to forge a partnership with the vendor based on project goals that align with organizational objectives at the forefront. The findings were in-line with current literature in that the role of project manager has increased moving from a narrow focus of short-term project deliverables to a focus that complements long-term organizational strategies (Sundqvist, 2019).

Correlations with the conceptual framework. Step four in Gartner's (2006) framework is related to change in operating practices and one of the associated subcategories is improve information system business practices. Specific to vendor negotiation is technique 23, contract renegotiation (Gartner, 2006). C3 previously asserted, "The whole project is a negotiation." Understanding that projects are often inherited by project directors and managers after the vendor contracts have been endorsed, it is not uncommon to renegotiate based upon unforeseen circumstances, external influences, internal policy changes, etc.

With regard to cost containment, project directors and managers should consider renegotiating maintenance and service contracts to garner better prices and terms as part of their ongoing strategy (Gartner, 2006). When renegotiating a contract initially presented by a vendor, C2 was able to save the project $40K in expenses. Understanding

the requirements allowed for streamlining of processes. Thoughtfully presenting the case for renegotiation included determining the design and requirements definition for the implementation. Organizations saved an average of 22% when they renegotiated the vendor's initial cost estimate (Panorama Consulting, 2019).

Perhaps the last statement regarding Gartner's (2006) framework is of most importance as it states the need to develop a multiyear cost containment plan that achieves additional business benefits. An organization's unrealistic expectations about ERP cost of ownership can lead to implementation failure because organizations defer to cutting corners on essential activities that are deemed critical success factors (Panorama Consulting, 2020). The participants in this study understood that the success of their implementations heavily depended upon their ability to work with the vendors in a transparent and efficient manner even when they did not have the opportunity to participate in vendor selection. Understanding that vendor expertise was critical in the areas of development hours estimation, schedule planning, and in knowledge transfer with regard to technical and system functionality, participants agreed that having a positive vendor–client relationship matters.

Underscoring a positive vendor–client relationship is trust and effective communication about expectations at the forefront. While the priority of project directors is often short-term delivery, in HEIs strategic aspects should be considered for long-term stakeholder benefits and IT realization (Sundqvist, 2019). Developing a multiyear cost containment plan as Gartner (2006) stated is a start toward that end. A positive vendor–client relationship is pertinent as they play an important role in helping project directors

and managers achieve both project and organizational goals. As C4 noted, “During the negotiations, you’re relying on the vendor to help plan the rollout schedule - they [should] help you plan.” When project directors and managers develop a cost containment plan that aligns with organizational strategy and is supported by essential stakeholders throughout the process, the project team has a greater chance of completing an ERP implementation on time and within budget.

Theme 4: Organizational Change Management

Theme 4 was organizational change management. All the participants affirmed organizational change management as a critical component of project implementation. While OCM is commonly considered as a component of project methodology, past research has shown that it was not consistently regarded as a high priority in ERP and IT implementations (Hornstein, 2015; PMI, 2017; Reitsma & Hilletofth, 2018). Given a successful ERP or IT implementation heavily depends on the project director or PMs ability to effectively manage people, technology, and processes toward value realization for the organization; it is doubtful that a cost containment strategy that lacks OCM is worth pursuing. The data revealed 39 instances of OCM. These results are aligned with recent studies, as more organizations have reported a greater investment and stronger focus on change management (Garg & Khurana, 2017; Ghobakhloo et al., 2019; Luftman et al., 2017; Panorama Consulting, 2017; Panorama Consulting, 2018; Panorama Consulting, 2019).

Three subthemes emerged: (a) transparency and communication, (b) BPR, and (c) culture. Of the emergent subthemes, transparency and communication was addressed

most frequently. C5 surmised, “Change management is a structured process of a well-structured project.” To negate the potential risks related to ineffective change management, C5 noted:

> At meetings, we have everybody around the table that we need to make project decisions. Modification change requests, the whole change management process is a fairly formal piece of the work that we do as project managers. You do not start a project without really thinking about what you want to achieve or thinking about the resources that you’re going to need to achieve it, which is not just money, but also time and skills, people, equipment, all of those things. What does done look like in terms of this project? That is the biggest piece for me in terms of how you manage - that is really defining what your goals are upfront, getting everybody on the same page.

Value realization from a successful ERP implementation only happens when organizational fit is optimized through ERP capabilities (Czekster et al., 2019; Niu et al., 2017; Ruivo, Johansson, Sarker, & Oliveira, 2020). C1 stated, “Knowing that the PeopleSoft software works, it was really about getting the usage and adoption piece that seemed to be a big thing.” C1 further specified:

> I went and did some extra training in change management. I lead the change management piece. I gave some training on change management to leadership. I trained first line managers on change management best practices and brought in some change management methodology they did not have before. I felt that was worth the cost of asking the implementation team to spend more time, effort,

> [and] money with regard to educating and giving them [client organization] access to the software, getting them involved, and more engaged in workshops.

From a vendor perspective, C3 noted that while cost containment is significantly relative to change management, the human factor extends beyond cost. C3 explained, "Cost containment is not just delivering what we promised. It's about having buy in and complete understanding of that." The success of an implementation is about more than processes and technology, but rather about people holistically moving in the same direction to achieve a common goal. A review of both past and current literature shows that implementation issues often have less to do with technical issues in comparison to the human aspects of organizational change (Awa, Ukoha, & Emcheta, 2016; Brunet, 2019; Mahmood et al., 2019; Noaman & Ahmed, 2015). C2 explained:

> A software vendor is going to have a clear scope of work for much of the technical aspects and they are going to have some high-level points about the nontechnical aspects. But, unless you have a really, really thorough change management plan, it is very hard to have a scope of work where you can effectively estimate costs for that work. That is where you really need a formally trained manager to build that change management plan depending upon what level you are tracking costs at.

Providing a different perspective, C4 expressed how project team members and members of the [client] organization often have different work ethic or objectives that can be challenging when working toward a common goal. C4 reflected:

> When you start a project, you have a clear goal. There is an end date and leadership supporting you to go get it done. But, the operational side - their mindset is different. So, it is like the day to day work that they do, and it is a little bit of a slower pace. It is more about processes and improvement, probing those processes, standards, and stuff like that. When you are in a project mode, you are tactical, so you have all these constraints. I am going to do it to the best my abilities. I do not have the luxury to think about best practices, all the time. So, there's always this outside view about the project that they are not doing it right. Yeah, it is a different perspective and that kind of creates tension [between the two groups.]

A key factor in overcoming obstacles related to dynamic change involves learning how to manage resistance to change (Drummond et al., 2017). Resistance to change may be due to a myriad of reasons. Cost containment amid resistance to organizational change can still be attained depending upon how changes are communicated. C2 shared:

> One thing that people are always sensitive about and is a known factor with implementations is when staff are presented with a new tool that they now need to learn. They oftentimes would like additional compensation for having to learn this new tool and see it as a change in their job description. We approached it [this concern] from something of a cost containment strategy. One piece of our strategy was to reinforce the idea that it is not about what tool you use to get the work done. It is about the tasks that you are trying to do. So, if you are the event planner for your college, it is the same job with the same job description.

> Regardless if you are using a fancy online tool or doing it on calendars, your job is the same. So, we were trying to limit the amount of additional compensation requests that we got.

Table 6

Organizational Change Management Subthemes

Theme	Frequency of occurrence	Percentage of occurrence
Transparency and communication	5	100%
Business process reengineering	3	60%
Culture	3	60%

Transparency and communication. Transparency and communication was the first subtheme under OCM. This subtheme emerged within data collected from all participants. Effective communication when implementing an ERP system requires contemporary project management skills (Garg & Khurana, 2017). Regardless of what the risks to an ERP implementation may be, the impact of how people compensate for the reality of dealing with challenges are often better understood and malleable when decisions are communicated from the source and sooner than later (Musawir et al., 2020). C1, C2, and C3 concurred with the ideal of transparency and the importance of having an effective communication strategy. Alternatively, project implementations void of transparency and effective communication are more apt to experience project scheduling delays and costly budget over-runs (Mahmood et al., 2019). Transparency was key to

helping college leadership understand what the outlay of expenses could be as they were told upfront that external agency resources were limited. C1 asserted:

> Our agency told each of the college leadership teams that this [implementation] was going to cost more than what the leadership of college's initially thought to have people with knowledge, skills, abilities, and training expertise in PeopleSoft at their locations and not just to rely on the agency [funds and resources]. The agency was trying to help the colleges have a realistic understanding of what it is [the implementation] going to cost.

C2 understood that making the choice to implement one instance for three separate units would not only create homogenous business practices, but also contain costs. End users must be more innovative in their thinking to reengineer business processes to fit with the ERP software while minimizing customization (Mahmood et al., 2019).

Changes, whether planned or unplanned during an implementation, could impact a vendor's ability to meet project expectations as well. If a contractor, for example, becomes consumed about their exposure to risk or reduction in profitability, yet fails to inform the organization to potentially mitigate the risk; the partnership between the organization and vendor could deteriorate as economic self-interest could become the priority (Musawir et al., 2020). As a vendor, providing honest, firm estimates to the client is critical. C3 affirmed:

> As far as the project team goes, you need to state upfront the number of hours it is really going to take the client on their part for the work. And do not lowball the

> client side. Companies [often] come out and they lowball the client's effort. And they figure the clients [are] going to pony up and eat it later. If you lowball on the client side, they are going to push to you to absorb the cost, because you never told them it was going cost them 5,000 hours of effort [for example]. It comes back to scope creep, or cost creep back to you [as the vendor], or they are going to refuse to do the work. Now, it is going to be scope creep, because now your guys have to do it.

Effective communication with users of the system before, during, and after the implementation is equally as important as effective communication with the project team and vendor consultants. C4 stressed that while the project team is responsible for successfully implementing the ERP system, the project team does not make the decisions for how the organization will use it. Future users of the ERP system rely on the project team to inform them about best practices (Mayeh et al., 2016). However, project directors and managers should be clear about their expectations of the organization's decision makers concerning requirements needed for business processes. C4 maintained that as a project, they were transparent to their stakeholders, especially the SMEs, as the common sentiment was, "Hey, we're not going to make decisions for you. So, here is what you have. You manage it. We will facilitate it."

An ERP system implementation is a disruptive process for any organization (Panorama, 2019). To keep further disruptions at a minimum during the implementation transitional period, communication must be clear and transparent. Some organizations have a linear approach to communication, while others implement two-way

communication, for example. Either way, open lines of communication between departments allows for increased understanding of system applications and processes because ERP systems are cross-functional (Arthur, 2016; Mahmood et al., 2019). For project management, the key to effective communication as C5 shared is ensuring, "…that starting at the beginning of the project, everybody gets on board."

Effective communication is critical throughout the duration of ERP implementation (Mahmood et al., 2019; Mayeh et al., 2016). Accountability and transparency are attributes of effective communication, especially with regard to cost containment strategy. Stakeholders must be aware of the status report and updates of information that might directly or indirectly impact them or their work (Mahmood et al., 2019; Such, Ritzhaupt, & Thompson, 2017). When stakeholders are aware of the status of the project and associated risks, if any, all stakeholders can actively participate in mitigating the risk. As C5 noted:

> When it comes to budget and scope in particular, what is it that you are going to do? And how much is it going to cost you to do? If you gather the right people at the beginning of the project and have those conversations about what is it you want to do and how much money are we willing to spend on this, and where do those two actually meet? What you end up with is a group of people who are intimately involved in the project, who are aware up front of the barriers. They are aware of the constraints that they are dealing with. They say, "We've been given a million dollars for this project, we have to make that work." That is the biggest cost containment strategy.

Business process reengineering. BPR was the second subtheme under OCM. The task of BPR often involves stakeholders from several departments and functions across an organization depending upon the type and extent of the implementation. Given ERP system deployments are disruptive in nature for organizations migrating away from legacy systems, it is imperative for project teams to examine organizational business processes to determine the correct implementation approach (Panorama Consulting, 2019; Paredes & Carvalho, 2019). Some examples of different implementation approaches include (a) a phased approach by module, location, or business unit, (b) a big bang approach that involves implementing all modules of a product simultaneously, and (c) a hybrid approach that may combine different approaches based on the organization's specific needs (Panorama Consulting, 2019). Without specifying which approach was taken, from a broad perspective, C1 stated, "Different leaders of different parts of the organization put together their process flows documenting their current state processes and then looked to the future state as well as the change impacts."

If the ERP system facilitates a more efficient way of doing business, the organization is more apt to change operational processes to adapt to the ERP system (Niu et al., 2017). Congruent with current literature, C5 remarked, "Typically, with ERPs the business changes their processes to match the software as much as possible." When organizations keep knowledge integration as a focus of reengineered business processes, task efficiency across the organization is likely to improve (Mahmood et al., 2019). Whether the goal is BPR or business process alignment, each approach can be used to increase task efficiency and knowledge transfer. C2 shared:

> Another way that we approached cost containment was to do some business process reengineering. One aspect of that was a train the trainer approach. We had district staff who were focused on the implementation, who we were able to use local knowledge and resources to essentially provide that business process reengineering experience. So, for instance, our system administrator went into one of our colleges [within the district] and retrained their class schedulers to use the new system, worked with them, and facilitated the creation of a new process for their class canceling. That was very successful as we experienced turnover and needed to train new people.

Business process alignment from a resource perspective is different from business process reengineering. C2 explained:

> We also had a local group of subject matter experts who could do training, a local system administrator, and a backup system administrator. In this case, it was more about a business process alignment facilitation system. We had a process where we needed to change who is doing what and when they are doing it. We came to an agreement on what that looked like, and really facilitated a successful change.

Culture. Culture is the third subtheme that emerged under OCM. In a general sense, culture is considered a shared set of ideas, norms, beliefs, values, or understandings that groups of people orient with and are reinforced by practices, routines, and stories (Adams et al., 2018). From the perspective of organizational culture, C3, C4, and C5 addressed the importance of establishing a teaming culture, the challenges

associated with organizational culture vs. project team culture, and cultural bias related to resistance to change, respectively. C3 posited:

> Culture matters. I think the number one most important thing for productivity is building the right teaming culture. Otherwise you are doomed from the start. You got to have a lot of opportunities for the project team, to get together away from your client to be able to ask questions. Have an offsite discussion every two weeks, two hours where you come prepared with the questions and things that the rest of the team might be able to point you in the right direction. That is another way that you can have the team contribute productivity because you are taking the fear out. That is the kind of culture that you got to have. You have to be able to mentor each other.

Beyond mentoring, the potential increase of knowledge transfer and increased capacity regarding ERP implementations is higher when internal resources join the project team. The advantage lies in the experience that an internal resource has regarding historical context of the legacy system and organizational affinity that may take an external resource a greater amount of time to obtain (Sundqvist, 2019). When C4 needed additional resources to accomplish project implementation milestones, internal organizational resources were used to fill in the gaps. C4 discussed:

> The project is not with the rest of the organization that is in that building. We had to actually start pulling resources from the other groups within the organization. That created a rift between the project, which has a certain culture. This was not a short project and interestingly enough, most resources stayed [did not go back to

> their old jobs] on the project from a support perspective for the product. They wanted to stick with this [their current assignments on the team] because they knew the customers.

An ERP system integrates business processes and functionalities across an organization. In the same manner, organizational effectiveness when using an ERP system highly depends upon knowledge sharing and acceptance of adopted or reengineered business processes (Ramdani & Hadijah, 2020). C5 reminisced:

> It is an interesting time in the culture. People tend to assume that the way we did it before is how we are going to do it going forward. A natural cultural bias is that we have people doing the same types of jobs in different areas but, doing it differently because they are following what they know instead of working towards developing a new norm.

Correlations with peer-reviewed studies. Organizational change management that is carefully and effectively implemented facilitates the successful adoption of ERP (Awa et al., 2016). Current literature supported the notion that risks can be mitigated by focusing on effective BPR and OCM which also ties to the findings within this study (Drummond et al., 2017; Such et al., 2017). Cost containment strategies used by project directors and managers to support successful ERP implementations are highly dependent upon the support and commitment to those strategies from leadership and decision makers who influence the outcome of the project. Moreover, transparency and effective communication is key to realizing cost containment and organizational change (Mahmood et al., 2019; Panorama, 2019). Other scholars also reported frequent project

meetings and interactions require high-quality communication void of barriers of any kind (Ekrot, Rank, & Gemunden, 2016; Zhu et al., 2019). Similarly, C4 highlighted whether with the project team or future users of the system, “You just need to build those relationships and have those conversations with them.”

As organizations expand, a system that can scale to meet the needs of its members is required (Panorama Consulting, 2019). Given the unique environment that HEIs operate within, implementing an ERP solution often requires BPR to align operational processes with the functionality and capacity of the ERP solution. While each participant noted the barriers experienced despite successful implementations; the common denominator for their success was rooted in transparency, solid communication, and a shared commitment amongst stakeholders to improvise as needed as long as the adjustments were within scope and budget. Exceptions to scope and budget were explicitly reviewed and decided upon by the steering committee. As C5 stated, “We have a standard change management request form and process that we use. From a project management perspective, we capture that request and we present it to the steering committee.”

By automating, streamlining, and integrating business processes, information systems optimize information, leading to increased productivity and a reduction in costs (Chaushi et al., 2017; Eseryel, 2019). However, users are often reluctant to use, assimilate, or adopt the new system if they do not understand how it operates (Haddara & Moen, 2017). Within HEIs specifically, users often feel more inclined to migrate to new systems when there is a community of end users available to them who can candidly

share recent experiences and knowledge regarding the implementation process and understand how the new system has positively impacted their daily work (Such et al., 2017). C1 and C4 alluded to similar experiences where their efforts to organically build user groups, share knowledge, streamline, and reduce the costs of duplicate business processes and training respectively garnered positive results. Of important note about BPR is that current literature and the findings within this study support the notion that successful reengineering of processes facilitate a greater adaption and function-fit of the new ERP system, which also reduces the resistance to systematic and organizational change (Reitsma & Hilletofth, 2018; Shao et al., 2017).

Research indicates that organizational culture has a significant impact on ERP implementation success (Loch et al., 2017; Mahmood et al., 2019; Panorama Consulting, 2019). From a project team perspective, C3 noted ideally project directors and managers should cultivate a culture of teamwork and allow for offsite meetings to freely discuss issues and concerns, "…away from the client…there's nothing wrong with that, if you can foster that kind of open culture." C3s understanding and suggestion aligns with current literature. Establishing a culture of no-blame where people on the project team can report their problems or the problem of a colleague is essential for collaboration and ensuring team members are part of the solution and not the problem (Drummond et al., 2017; Loch et al., 2017; Zhu et al., 2019). Moreover, organizational cultures enabling successful ERP implementations should resemble environments where shared beliefs about learning and development are encouraged, innovative ideas flourish, and where knowledge and skills are highly transferable (Mahmood et al., 2019). Just as C1, C2, and

C5 acknowledged and Shao et al. (2017) reported, participative decision-making promotes better understanding and appreciation of the ERP system, integrated business processes, functionality, and the impact of changes that one part may have on the rest of the system. Realizing that changing organizational culture does not happen overnight, transparency and communication are critical to achieving that end state.

Correlations with the conceptual framework. An essential component of developing a cost containment strategy to support an ERP implementation is to analyze IT costs from multiple perspectives (Gartner, 2006). Looking at IT costs from multiple perspectives may include understanding an HEIs intent or strategic plan for IT innovation, a vendor's advice on best practices regarding approach to ERP implementation, and including stakeholders, both IT and non-IT alike in process decisions that will impact users of the system. The data collected revealed that each participant understood the importance of OCM and affirmed that efficient organizational change management was essential to the success of their implementations. Other scholars have reported that while managing change is essential to all ERP implementations, rarely do organizations allocate the required time, budget, or resources to ensure success (Eseryel, 2019).

The findings in this study contrast starkly as the participants were either supported directly or found innovative ways to keep efficient change management initiatives in focus throughout IT and ERP implementation, which attributed to their success. The process of change management is not a simple, rote process that anyone can do as C5 noted, "We include change management expertise on projects." C1 took the initiative to

pursue and obtain Prosci change management certification for the benefit of training project team members and organizational users as they transitioned onto the new ERP system. C4 established that a thorough change management plan is needed to accurately estimate resource costs and a formally trained manager is needed to build an effective change management plan.

The data collected regarding OCM align with change operating practices in Gartner's (2006) framework. Specific to cost containment, technique 15 refers to consolidation, standardization, and automation for economies of scale and resilience (Gartner, 2006). C1, C2, C3, and C4 detailed recent experiences with full cycle ERP and IT implementations involving several units. Globalization of processes where possible and minimal customization were key to containing costs and scaling the system with repeatable processes during the implementation. C4 explained how the project not only contained costs by utilizing one instance for three separate colleges, but also standardized processes to reduce complexity of the system, which aligns with technique 16 and 24 of Gartner's (2006) framework. Technique 16 refers to standardizing the operating environment to reduce complexity while technique 24 involves IT operations process improvement toward increasing rigor for numerous benefits, respectively.

Summary of Major Themes

Despite previous literature concerning failed ERP implementations, HEIs continue to adopt ERPs to replace separately supported legacy systems because they facilitate the integration of administrative functions using modern technology, provide accessible data in real time, and ensure competitive advantage toward successful student

outcomes (Chaushi et al., 2018; Grajek, 2018; Seo, 2013). Participants highlighted risk management as everyone's role on the project team and ineffectively monitoring risks and issues could negatively impact project outcomes. Just as there is a critical need for IT initiatives to align with HEI objectives and mission, synergy must exist between PMO and project governance (Ratshitanga et al., 2019). The impact of environmental changes may derive from the potential of political, competitive, or external circumstances such as accrediting bodies, collegiate associations, and state and federal agencies (Brown, 2018). As C4 noted, there were some political areas that the project team had to invest in as their constituents had a particular interest. The findings within this study are in alignment with existing literature as ERP systems within HEIs must be agile enough to respond to the impacts of external changes that are both expected and unforeseen (Ratshitanga et al., 2019).

Acquiring adequate resources to fulfill key roles during an implementation can be challenging. C4 was successful at attaining resources needed for development by utilizing organizational resources fortuitously. However, having a well-prepared resource plan prior to implementation would have negated or reduced that risk. Given contemporary and cutting-edge IT skills are scarce in some organizations, creative agreements with ERP consultants to train organizational staff may be an option for shoring up needed resources during and after implementation (Eseryel, 2019).

As the findings in this study revealed, there are advantages to enlisting organizational resources as part of the project team. When effective collaboration among internal SMEs, external consultants, and the project team exists, knowledge transfer is

continuous (Drummond et al., 2017; Veres et al. 2019). Consistent with reviewed literature, the project team members learned from external consultants, internal SMEs learned from project team members, and SMEs were able to further transfer knowledge and train their community of users. While knowledge transfer may be difficult to measure, the intangible benefits and advantages of using shared resources outweigh the disadvantages (Niu et al., 2017). Participants in this study understood that reducing resistance to change among users was congruent to increasing shared knowledge and vital to completing their implementations on time and within budget. In a current report by Panorama Consulting (2019), small-medium organizations used on average seven full time internal resources and larger organizations averaged 24 full-time internal resources. The tangible outcomes of using shared resources included significant costs savings.

While doing more with less resources may not be optimal, Gartner's (2006) IT cost containment framework associates this concept with understanding organizational cost structure and the potential for savings. Understanding organizational cost structure is key, as allocating less than optimal resources in the initial implementation plan or consequently deciding to do so during implementation can have negative impacts on employees, specific to change fatigue and resistance to future changes (Panorama, 2019).

C1 and C4 acknowledged that their project teams, internal resources, and consultants experienced change fatigue related to doing more with less at various times throughout their projects. However, the project teams of each of the participants in this study enabled a strong communication plan that emphasized organizational goals and the requirement to replace legacy systems as supported by leadership. Accordant with

existing literature, communication plans should be developed to reinforce the IT vision before, during, and after implementation by key individuals to consistently explain the need for transformation throughout the organization to all stakeholders (Eseryel, 2019).

Each of the participants had a strong commitment to consistently align organizational objectives with their primary role of completing the project implementations on time and within budget. C4, along with the project team, considered the timeline for completion nonnegotiable. The participants' commitment and organizational leadership support as inferred in the results were clearly motivating factors for project team members to persevere despite doing more work with less resources. C1 cited, "… people believed in the project."

Simply reducing costs for the sake of saving money is detrimental to a long-term strategy where IT realization of benefit and value is desired (Panorama Consulting 2020; Yontar, 2019). To counter the potential of negative outcomes related to doing more with less, time and money should be invested in change management initiatives as part of the overall project schedule and budget (Panorama, 2019). Participant C5 affirmed that a change management expert is included on every project. Intentionally including change management methodology and associated costs as part of the implementation schedule and budget respectively will assist project directors and managers in their attempt to properly estimate resources required. Not doing so may result in a derailment of an otherwise effective cost containment strategy. The expenses associated with failing to invest in change management are significantly tangible (Haddara & Moen, 2017; Panorama Consulting, 2019).

Including the project director or manager in the negotiation of the vendor contract and even the development of the RFP provides a greater opportunity to limit potential risks from a project perspective sooner than later. More direct involvement at the onset of contract negotiation also allows the project director or manager to become more familiar with the project requirements, to influence choice in vendors based on reputation, capacity, requirements, and responsibilities before inheriting the project (Paton & Andrew, 2019). Having influence in vendor selection from a project director or manager perspective also helps to set the foundation for a positive vendor–client relationship. As participants in this study acknowledged, trust is a positive indicator of effective vendor–client relationships that provides a foundation for negotiation throughout the project, knowledge sharing, and support as needed. The project management team and vendors spend a considerable amount of time working toward shared project milestone goals toward a successful implementation. In an HEI environment, where learning is presumed as a high priority; the conditions necessary for ERP implementations are often complicated by competing agendas and strained capacity. As C2 noted, vendors are essential in terms of technical expertise, knowledge of system capability, and providing estimation and project schedule support, but they are rarely the most apt at formalizing an organizational change management plan that requires expertise specific to organizational culture and resource allocation.

Seamless customer facing IT and ERP integrations and implementations that replace legacy systems are a rare occurrence (Saas & Kemp, 2017). Navigating the complexities of an effective organizational change management in HEIs is a high-stake

process because the stakeholder that is impacted the most by a failed OCM, and a failed ERP is the student. HEI leaders have a need to meet established missions and objectives by providing educational value (Philibin & Kaur, 2020). OCM not only implies change for the constituents of the organization but can also impact how its customers are served.

Employees involved in an ERP implementation are often expected to learn the new system and associated business processes amid managing daily operations until the new system is fully deployed. From an organizational cost containment perspective, HEIs must concurrently manage scarce resources, funding from the government (if provided), intellectual capital, people, and time both efficiently and effectively (Philibin & Kaur, 2020). Contrary to the findings within this study and the larger body of existing literature; some researchers have reported that users have regarded organizational change management as insignificant when implementing an ERP system (Hornstein, 2015; Reitsma & Hilletofth, 2018). The difference in outcomes between the findings of this study and studies that claim OCM is not a critical success factor for project implementation may be perspective and maturity of project methodology.

The results from this study are specific to the perspective of the project director or manager, while the comparative studies noted were single case studies from the perspective of the end-user. Researchers use a multiple case study to explore both replication and differences of the findings across cases (Lashgari et al., 2018). Using the multiple case study approach for my research allowed for in depth inquiry across cases. Conclusively, all participants in this study recognized and affirmed how vital effective organizational change management is.

Investments in organizational change management can equate to decreases in an organization's average implementation costs and duration (Panorama Consulting, 2019). An effective organizational change management plan is built upon transparency and communication, outlines the approach regarding resources for business process reengineering, and acknowledges cultural implications throughout the project implementation. The findings in this study concur with the larger community of literature that suggests the same (Mahmood et al., 2019; Ramli & Widayat, 2017; Skoumpopoulou et al., 2018; Such et al., 2017).

Cost containment strategies alone do not guarantee a successful ERP implementation. However, the findings in this study reveal how critical it is for a project director or manager to have cost containment strategies at their disposal. When key stakeholders champion effective cost containment measures instituted by experienced project directors and managers, particularly during implementation via transparent and cross-functional means, the risk factors for a successful implementation are significantly reduced. Whether its reputation, relevancy, or simply to survive, HEIs are expected to keep pace with technological innovation (Such et al., 2017).

The complexities of implementing ERPs within HEIs are exacerbated by environmental impacts, socioeconomic factors, the need for competitive advantage, and a constrained budget all while providing an education worthy of supporting individual, collective, and community sustainment and growth. Cost containment strategies used by project directors and managers in support of successful ERP implementations within HEIs are critical to the reduction of project budget and schedule overruns. Perhaps even

more critically important is the alternative consequence where students become burdened with the costs of failed ERP implementations that also erode realization of IT benefit and value for all stakeholders involved. The findings indicated that when project directors and mangers used cost containment techniques that complemented the overall organizational strategy, the project team and organization were able to capitalize on improved agility and reduction of risk while saving the organization money. Moreover, ensuring buy in, garnering top leadership support, and effectively communicating cost containment strategies affirmatively from the beginning of the project until its completion is what ultimately led to successful completions of ERP and IT implementations on time and within budget.

Applications to Professional Practice

The purpose of this qualitative multiple case study was to explore strategies used by HEI project directors to contain costs during a successful ERP implementation. Given the ERP market will continue to grow by 7% until 2022, the need for effective ERP implementation strategies will continue (Ruivo et al., 2020). ERPs integrate key management, business, and campus solutions for HEIs, which increases capacity to make decisions in timely manner and provides greater access to organizational information while improving upon student services (Adejare et al., 2018; Chaushi et al., 2017). HEIs with intentional, transparent, and explicit cost containment goals indicated a stronger sense of accountability than institutions with undisclosed cost containment goals (Simon, Way, Polutnik, & Albright, 2019).

According to a recent report, 45% of all organizations reporting completed ERP implementations experienced budget overruns and the overruns exceeded budget by 24% (Panorama Consulting, 2019). Additionally, 58% of all reported organizations that completed implementations experienced schedule overruns where the schedules were exceeded by 11% (Panorama Consulting, 2019). With significant IT investment comes pressure to demonstrate realization of value. As such, HEIs continue to experience external pressures by lawmakers to give an account of educational output for the resource allocation related to monies received based upon organizational performance (Brown, 2017).

The participants in this study used cost containment strategies to successfully implement ERP and IT systems on time and within budget. The cost containment strategies were related to four major themes (a) project governance and PMO, (b) vendor negotiation, (c) resource allocation, and (d) OCM. The findings presented within this study are relevant to improved business practice. First, HEI leaders and project directors and managers can identify the appropriate project governance mechanisms and adequate type of PMO needed to ensure timely and cost-effective implementation of ERPs. Included within this study are more than 8 risk management strategies and 3 different approaches to cost containment related to contingency expense.

This study highlighted the importance of having an effective project governance and PMO that provides strong support for established cost containment strategies in alignment with organizational goals. Using cost containment strategies that are strategically aligned with organizational goals positively influences the outcome of ERP

implementation (Abdel-Haq et al., 2018; Grajek, 2018). Integrating best practices, project methodologies, and strategic cost containment strategies at the beginning of the project planning process is integral to cost containment and successful ERP implementation. Congruent with current literature, findings within this study affirm the need to use risk management practices before and during implementation as ERP is one of the riskiest types of IT to implement (Ghobakhloo et al., 2019). Some of the identified issue and risk management strategies related to cost containment involve a resolution management process; using policy to drive standardization; practicing risk identification and mitigation rather than risk avoidance; ensuring visibility of issues and risks at every level; and using risk management tools to document, monitor, and communicate risks that may exist for the project.

In project implementations, allocation of contingency expense within the budget complements cost management as it provides a buffer against unknown events (Kuo, Nugroho, & Zulvia, 2019). As mentioned previously, the approaches used regarding contingency expense varied as one participant garnered additional funding for contingent implementation work by associating said requests with other organizational initiatives. Other findings were consequential as the initial budget was either updated to reduce other areas of funding to accommodate contingent requests or end users were told that requests beyond scope may be considered later. From a traditional and practical perspective, contingency expense should be estimated and allocated accordingly before and during the execution phase of project implementation (Kuo et al., 2019). This approach resonates

with cost containment strategies revealed within this study as C5 asserted, “Any budget that we build, we build in a contingency.”

Second, efficient resource allocation without compromising project outcomes is critical for HEIs that operate within environments of limited resources. Resource costs are a significant portion of the total project budget for ERP implementations. In this study, intelligible evidence based on successful practice has been generated that provides practical tools that project directors and managers can adopt for use in ERP implementations. The participants in this study have successfully used several cost containment techniques identified by Gartner (2006) that were specific to their project environment.

HEIs can benefit from the use of shared organizational resources (Niu et al., 2017). In this study, cost containment strategies associated with shared resources involved attainment of optimal balance between project, organizational, and consultant resources; sharing costs incurred for needed organizational resources; flexibility of remote work or telecommuting; reduction of labor costs through staff reconfiguration; and selective outsourcing of noncore functions. While some project directors and managers may consider allocating a significant portion of their budget toward offshore resources as a cost reduction strategy, the findings revealed that a balanced resource plan that includes an effective mix of resources is more advantageous.

Two cost containment strategies relative to doing more with less emerged in this study. The first cost containment strategy is the emphasis on how essential it is for project directors and managers to manage the human cost. As shared by the participants in this

study, managing the human costs involves constant communication about the goal and status of the project, believing in the team's ability to implement the project, motivating team members when resources are thin, and having a firm agreement about a nonnegotiable timeline. When users believe the ERP system will increase task efficiencies and add value to their roles by enhancing communication, information, and knowledge empowerment as added benefits, they will be more inclined to use the system than ever before (Rouhani & Mehri, 2018). The second cost containment strategy involves assessing current resources to effectively create or streamline roles that meet required objectives while maintaining planned cost containment strategies and efficiencies. While having less than optimal resources during a project implementation can lead to cost and schedule overruns, this study contains proven strategies that project directors and managers can use despite the lack of sufficient resources.

Third, project directors and managers are expected to maximize their use of available resources to achieve the triple constraint by delivering project solutions according to scope, on time, and within budget. According to PMI methodology, project directors and managers should also balance the constraints of quality, resources, and risk along with the triple constraint to produce expected ERP implementation results (PMI, 2017). The findings within the study include successful vendor negotiation strategies for ERP implementers. Providing cost containment strategies from a consultant and project director or manager's perspective extends contextual understanding toward business practice application.

The findings presented are essential to achieving solid vendor–client relationships and sheds light on the need to include project directors and managers in vendor contract negotiations. In alignment with current studies, there is a growing need to include project directors and managers much earlier in the project planning stages than established bodies of knowledge have suggested (Pinto & Winch, 2016; Sundqvist, 2019). For example, inclusion of project directors and managers at the start of the RFP process increases transparency, which helps to negate duplicity of effort, strengthens efficacy of project outcomes as the project director or manager has more time to acquaint themselves with the project, and resolves the need for project directors and managers to ask direct questions related to project methodology and software development at the onset of project development rather than during project implementation. HEI leaders and project directors and managers may determine findings identified within this study as immediately applicable in working with PMOs to codify the lessons generated into standard operating procedures for HEI PMOs.

Successfully implemented ERPs can deliver both tangible and intangible benefits within HEIs (Skoumpopoulou & Robson, 2020). Intangible impacts are often harder to quantify than real, tangible impacts during ERP implementation (Mekadmi & Louati, 2019; Ramli & Widayat, 2017). However, some findings within this study suggest otherwise. Some intangible benefits of cost containment strategies used to support successful implementations involve effective outcomes utilizing the train-the-trainer approach where SMEs gained skillsets and knowledge from the project team and

consultants. SMEs used the knowledge gained to streamline and standardize business practices and encourage the emergence of user group communities.

A user group community can help facilitate knowledge transfer. User group communities engage in discussions and are informed about pain points, concerns, advantages, and benefits of the ERP, which helps to diffuse fear and catalyzes acceptance of the impending change (ElFarmawi, 2019; Haddara & Moen, 2017). The findings in this study also showed that participative decision making attributed to increased comprehension and appreciation by the user. Project directors and managers can use participative strategies to allow future users of the system the opportunity to freely navigate the system prior to deployment, encourage participation in process design, provide resources for continuous training, and stimulate the creation of community user groups, for example (Haddara & Moen, 2017). From a user perspective, direct strategies are less effective as they often involve transactional outcomes that rarely reduce resistance to ERP adoption (Haddara & Moen, 2017). HEIs and other organizations that plan to implement an on-premise or cloud ERP may benefit from this study.

The findings within this study revealed three subthemes of transparency and communication, culture, and business process reengineering under the major theme of OCM. These subthemes more than any others discussed in this study have applications to business practice and social implications. Employees tend to resist proposed change when they perceive threats to job security, potential changes required in their work routines, or fear of the unknown (Drummond et al., 2017). Emotional intelligence, empathy, and

cultural agility are a few of the characteristics that competent project directors or managers should possess.

It is imperative for organizations to allocate sufficient resources and invest adequate time and effort to organizational change management initiatives (Garg & Khurana, 2017; Ghobakhloo et al., 2019; Luftman et al., 2017, Panorama Consulting, 2020). The findings within this study exhibit the same narrative as the participants clearly expressed awareness of cultural influence and impact. Some participants took the initiative to mentor and build relationships between project team members, whether internal or external. Understanding that investment often requires the knowledge of expert organizational change agents; one participant was self-directed in their endeavor to become Prosci certified, which served as a mutual benefit. Each of the participants were either supported directly or found innovative ways to keep efficient change management initiatives at the forefront of their IT and ERP implementations, which contributed to their success.

Implications for Social Change

Themes from the literature review, findings from the results of this study, and current literature highlight the importance of people as a critical component of a successful ERP or IT implementation. Organizations who focus more on sociotechnical concerns rather than technical issues alone will achieve greater IT benefit realization (Mahmood et al., 2019). Through a cost containment lens, implications for social change include increased fiscal accountability of the funds used to provide an education worthy of the 21st century. Tuition increases by HEIs in the United States are constantly under

examination as the costs often outpace the rate of inflation (Simon et al., 2019). Students from varying backgrounds and economic ability often carry the burden of funding ERP implementations within HEIs. Whether the burden of the costs affects students while in school or contribute to the debt once the academic journey ends, the impact is often unequal from an economic, social, and racial perspective.

Minority and linguistic groups of high school graduates as compared to White high school graduates face significantly greater challenges (Kim, McVee, & Faith, 2019). Implementation of ERP systems that can be used from anywhere at any time helps to level access for underprivileged and underserved members our communities that may not be able to attend brick and mortar HEIs. Not only is attainment of a college education critical in the 21st century global economy, it is one of the most significant factors of determining future earning power (Kim et al., 2019). Enabling distance and online educational opportunities alleviates potential resource barriers that are often structural in nature. Examples of such barriers include lack of transportation or funds to commute, childcare expenses while physically at school, and circumstances related to familial obligations where physical presence at home or work is required.

For some students, ERP systems simply provide enhanced capability to attend class in a more convenient way. However, ERPs within HEIs enhance access to educational opportunities for society at large, while slightly bending the arc toward greater equity in post-secondary education. College access and equity are critical policy considerations for HEIs (Kim et al., 2019). In this regard it is imperative for project directors and managers to use cost containment strategies where possible to support

successful ERP and IT implementations on schedule and within budget. Additionally, to obtain realization of IT value and benefits for all HEI stakeholders involved, ERP implementations must be strongly aligned with the strategic direction of the HEI (Philibin & Kaur, 2020).

Recommendations for Action

Cost reduction is a standard goal for organizational leadership when envisioning strategic and competitive advantage from ERP system implementations (Eseryel, 2019). Beyond cost reduction are the positive impacts on HEIs and its constituents when project directors and managers use cost containment strategies to implement ERPs on time and within budget. Project governance bodies (e.g., councils, steering committees, etc.) and PMOs should strongly support project directors and managers in their efforts to use proven cost containment strategies related to risk management, contingency expense, resource allocation, vendor negotiation, and organizational change management found in this study. The support provided should also include a discussion on alignment of ERP implementation cost containment strategies with the strategic goals and mission of the HEI.

Three recommendations generated from the study findings may be of help to HEI leaders and project directors and managers implementing ERPs, (a) codification of successful HEI ERP implementation into standard operating procedures where applicable, (b) ensuring HEI project team directors and managers are included in the vendor procurement process prior to the start of implementation, and (c) HEI leaders and project team members should adequately invest in organizational change management as

it is relevant to every phase of the project life cycle and its impact on project success should not be underestimated. HEI leaders, ERP implementers, staff, vendors, and consultants should pay attention to the results of this study as the findings provide rich, contextual data from multiple project director and manager perspectives that may help to improve current business practices.

The first recommendation from this study is codification of successful HEI ERP implementation into standard operating procedures where applicable. HEIs are unique as the organizational business model, processes, stakeholders, and activities are different from corporate business structures (Singh & Arora, 2018). Vendors and HEI leaders, project directors, and managers often have different ideas about the role of technology or best approach for ERP implementation (Saas & Kemp, 2017). Vendors and consultants who use standard operating procedures and best practices specifically for HEI ERP implementations will have a firmer grasp of what HEI leaders expect regarding IT realization, expected benefits, and ROI. The standard operating procedures manual should include viable cost containment strategies to support the consideration of risks, contingent expenses, external influences, resource allocation planning, vendor negotiation, and organizational change management. The standard operating procedures should also be agile enough to make subsequent adjustments as needed based on specific HEI requirements. Given HEI implementers rely on vendors and consultants to provide best practices for their institutions, it is imperative for vendors and consultants to fully understand and have documented methodologies, strategies, and approaches that work

best in an HEI environment. A standard operating procedures manual for successful HEI ERP implementations is a start toward that end.

The second recommendation is to ensure HEI project team directors and managers are included in the vendor procurement process prior to the start of implementation. Experienced project directors and managers are better equipped to ask potential vendors and consultants specific questions related to conversion methodology and software development capability and capacity, for example, to determine best fit. A contract analyst, who may be present during vendor contract negotiation, may not be concerned with or comprehend the necessity to ask specific questions regarding ERP-organizational fit. Not having a knowledgeable and experienced IT project director or manager during the vendor selection process and vendor contract negotiation could mean that relevant, yet unknown issues could become actual risks during implementation.

Reviewed literature and the findings within this study suggest that it is not a common practice to ensure HEI project team directors and managers are included in the process for RFP development or vendor contract selection or negotiation. However, the role of project directors and managers is moving from a standard short-term focus on project deliverables to a wider lens where the focus is greater alignment with long-term organizational strategies (Sundqvist, 2019). HEI project directors and managers have a pivotal role to ensure hired consultants, the project team, and all stakeholders involved clearly understand the objectives, requirements, and deliverables according to the project timeline and budget. Realizing that vendor reputation should be a key consideration when choosing which vendor to partner with, having an experienced project director or

manager who will lead the HEI ERP implementation included in the selection process is imperative.

Moreover, HEI implementers should have cost containment strategies built into their project plans. The cost containment strategies must be effectively supported by project governance and PMO. Given that project management team and hired external consultants must work together to achieve project milestones according to scope, positive vendor–client relationships are essential to this effort. Vendor–client relationships are most productive when there is trust and effective communication underscored by a firm understanding of the complexities of the HEI environment (Jeffery et al., 2017; Panorama, 2019). Including the HEI project director or manager in the process of vendor contract negotiations is a catalyst toward effective communication, transparency of expectations, and an opportunity to build a solid vendor–client relationship prior to implementation.

The third recommendation is HEI leaders and project team members should adequately invest in organizational change management as it is relevant to every phase of the project life cycle. The findings within this study revealed that transparency and communication, efficient business process reengineering, and assessing organizational culture are paramount to an effective OCM plan. Although there are extensive organizational benefits that can be achieved through successful ERP implementations, the benefits often are associated with significant risk (Panorama Consulting, 2020). OCM should not be an afterthought, as it requires estimation of resources, effort, and funding prior to ERP implementation. HEI leaders and implementers who invest in organizational

change management can help to mitigate risk. HEI project directors and managers who effectively use OCM along with cost containment strategies will achieve a leaner, more efficient user community that is more prepared to adopt the ERP system while simultaneously garnering significant cost savings for HEIs.

The results of this study are relevant to project directors and managers who are responsible for implementing ERPs within HEIs. I plan to publish this study via ProQuest to allow access to researchers studying this topic. The participants from this study will also receive a summary of the findings and recommendations for action. Dissemination of this study to HEI leaders, PMO, project governance bodies, project directors, project managers, and vendors will make the information contained in this study more accessible. I intend to present and discuss the findings of this study when opportunities avail at business conferences, PMI events, and at HEUG conferences. I may also pursue opportunities to publish my findings in peer-reviewed journals.

Recommendations for Further Research

The findings within this study indicate an emergence of practical solutions for HEI leaders and project directors and managers considering ERP implementations. The cost containment strategies addressed in this study are essential to achieving optimal outcomes from ERP implementations led by project directors and managers. Limitations addressed in section 1 included anticipated time constraints, costs, and potential data triangulation challenges. While two participants were interviewed by phone due to time constraints, the rest of the participants were interviewed face-to-face. Potential challenges

with data triangulation was significantly reduced as archived reports and organizational documents that aligned with other collected data were publicly available.

One study limitation was that the focus was on HEIs in one state. There may be different project governance structures and different sources of funding in other states and countries that may influence different outcomes. I recommend future studies focus on the application of HEIs in other states or countries to explore the extent to which ERP cost containment strategies may differ. Additionally, while COVID-19 emerged after data collection of this study, it would be interesting to see how HEIs that have relied on brick and mortar business models to provide an academic experience are innovating to implement ERP systems to enhance online service delivery models using cost containment strategies.

Reflections

As a professional with several years of experience in finance, education, and IT, I have witnessed the positive benefits and the negative effects of ERP implementations. An exhaustive literature review exposed significant gaps related to cost containment strategies used to support successful ERP implementations within HEIs. In this study, my goal was to seek in-depth, rich, and contextualized data where project directors and managers have successfully used cost containment strategies to implement ERPs in HEIs on time and within budget. Intentionally trying to neutralize my own biases by using an interview protocol helped to consistently drive the discussion with each of the participants. Because of the genuine candidness and substantively rich data provided from the participants, I was able to effectively acquire quality data explicitly from the

participants' experiences and worldviews. I found the data collection process and analysis both exciting and valuable as the processes provided a solid foundation that I can use with other professional and academic pursuits in the near future.

The doctoral study process has been a long, yet auspicious journey. Like rungs on a ladder, each milestone throughout the doctoral process represented an objective towards completion of a life-long goal. I aspired to become an expert at my craft and to provide a small, scholarly contribution to the field of business, specifically regarding ERP implementation and cost containment strategies for HEIs. Attending each of the required residencies provided confirmation that I had made the right choice to pursue a doctorate in business. As I reflected on the course of my study, I realized the substantial amount of iterations along the way pale in comparison to the end result.

I am often reminded that change is constant. I have had to revise, resubmit, rethink, reflect, and constantly envision what a meaningful study with real, practical, and social impact would look like. Most of the changes have led to improvement in my writing, a profound respect for the process of research, enhanced professional relationships, and a significant increase of knowledge gained that I find useful in my current profession. Attaining a doctorate degree is not for the weak at heart. Staying the course takes courage, commitment, and the strength to persevere amid disappointment when falling short of self-imposed goals. Having cohorts to share experiences with was encouraging as I knew there were other scholars who understood the weight of the rigorous process, the challenges I faced and the joy as milestones were achieved. I cannot underscore enough how critical it was for me to have a supportive team that was led by

my Chair, SCM, and URR. My team provided sound and essential engagement, consistent advice, and grace that has been paramount to my experiential learning.

Conclusion

Organizations that have unrealistic expectations about the total cost of ownership regarding an ERP implementation often make inept decisions and cut corners on critical activities that result in not achieving expected outcomes (Panorama Consulting, 2020). HEIs are not immune to this concept. Although technology contributes significantly to competitive advantage, technology does not singularly create organizational benefit (Panorama Consulting, 2019). Similar to findings in current literature, several of the emergent themes presented in this study are interrelated. As an example, 80-90% of IT governance initiatives are representative of cultural change (Selig, 2018).

Central to the consideration of new technology and ERP implementation within HEIs is the expected contribution from employees as the organizational culture of HEIs are multifaceted (Skoumpopoulou & Robson, 2020). IT realization of value extends beyond the physical confines of the HEI. Students choose HEIs for a variety of reasons, with technological capacity as a key component. Students often bear a huge portion of the technological costs and expect ROI. Benefits may include efficient HEI administration and customer service, enhanced skillsets learned, access to current research, and ultimately a rigorous education that supports a better quality of life as examples. Moreover, the society at large is a benefactor as the skillsets, knowledge, and potential contributions from graduates convert to real and practical assets for the workforce and their communities on a domestic and global scale. HEI project directors and managers

will achieve expected outcomes of completing ERP implementations on time and within budget when cost containment strategies are effectively supported by project governance, strategically aligned with organizational objectives by PMO, and communicated in a transparent manner throughout the entire ERP life cycle to all stakeholders involved.

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Appendix A: Interview Protocol

The purpose of this interview is to explore strategies that HEI project directors use to contain costs to support a successful ERP implementation on time and within budget. I will complete the following steps during each interview:

1. I will begin the interview process by providing a brief synopsis of the background of the research, the purpose, and time allotted for the interview.
2. I will thank the participant for agreeing to participate in the interview process.
3. I will reiterate that participation is voluntary, and should the participant decide to withdraw from the study, they may do so at any time through a verbal or written request, even after the completion of data collection.
4. Although my contact information was provided within the consent form, I will also be sure to provide my contact information again to each participant in case he or she decides to withdraw from the study.
5. I will use a sequential coding system to identify each participant during the interview recording and as I take field notes without using their names. Each participant will have a pseudonym identifier, such as C1, C2, C3, and so on.
6. I will explain that I will be the only person with access to the name of each participant that is associated with each of the pseudonym identifiers. I will also explain to each participant that the data from their interviews will be identified in my database and data analysis software using only their assigned identifiers.
7. If permitted, I will record the interview and begin to ask prepared, open-ended questions, to include follow-up probing questions as appropriate to expand upon

the participant's responses. I will watch for nonverbal cues and ask for clarification if needed.

8. After receiving an answer to the final question, I may restate or summarize information and ask additional questions if necessary, to determine accuracy of the participants' responses. I will also provide an opportunity for each participant to review the interpretation of their responses to ensure it is accurate and resonates with their experiences. I will wrap up the interview by thanking the participant for their time and willingness to participate.
9. If participants' share information about publicly disclosed project or company documents relevant to the purpose of this study (i.e., strategy or change management documents, project plans, budgetary information or requests), I may ask for specific guidance on how best to attain said publicly disclosed information. I will not request internal or private company documents from participants or organizations.
10. I will also remind the participant that I will provide him or her with member checking document(s) that they can use to review and confirm the accuracy of my interpretation of their responses. If necessary, I will schedule a follow-up member checking interview as well.

Participant Background Information

Please provide a summary of your ERP implementation experience.

Please describe your role(s) as a project director or project manager within the last five years.

How many full cycle ERP system implementations within HEIs have you experienced as a project director or project manager?

Interview Questions

1. What cost containment strategies did your organization review for its ERP implementation, and how did you decide which cost containment strategy would work best for your organization's ERP implementation project?
2. How did your organization assess the effectiveness of the strategies used for cost containment in your ERP implementation?
3. If risks were identified, what strategy or tool was used to ensure expenses remained in alignment with the ERP implementation budget going forward?
4. What, if any, strategies did you use during ERP implementation to address requests for changes or modification of requirements (technical, functional, or other) that had the potential to negatively affect the budget?
5. How were cost containment strategies communicated to stakeholders during ERP implementation, if at all?
6. How did you or your staff address requests made for additional resources or business process reengineering during ERP implementation that were not included in the budget?
7. How, if at all, were contingent costs related to changes in policy, whether internal or external to your organization, addressed within the ERP implementation cost containment strategy?

8. What other key challenges or barriers did you experience in developing and maintaining effective ERP implementation cost containment strategies?
9. How did your project team address the key challenges or barriers to the development and maintenance of your ERP implementation cost containment strategies?
10. What additional information would you like to share about your organization's cost containment strategies for ERP implementations?