The Mediating Influence of Culture and Behaviors of Stakeholders Relative to Clinger-Cohen Act Efficacy within Geographic Combatant Commands

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Abstract

The research problem was found in the dichotomy between employment and execution of private sector information technology governance practices and the furthering contrast within the Department of Defense relative to the operations community and the information technology community. On one hand is the requirement to achieve mission success through force application and, on the other hand, the requirement to foster organizational fiscal responsibility. Compounding this environment is the reality that Department of Defense mission areas tend toward low probability mission sets with high societal/geopolitical impact. Consequently, a state of competing strategic and operational goals can be seen in which the operations community focuses on mission success independently of costs while the information technology community focuses on private sector modeled governance. The purpose of this qualitative study was to examine the information technology governance phenomenon internal to the Geographic Combatant Commands' decision-making processes and to describe the cultural and behavioral frameworks relative to their influence on governance and Clinger-Cohen Act compliance. Furthermore, the objective of the study was to explore and identify Service and Joint related normative roles for information technology governance. Stakeholder Theory was employed thus providing a theoretical framework relative to internal and external organizational actors while incorporating the themes of strategic alignment, information technology maturity models, and resource allocation. The findings of this study noted four macro themes focused on organizational processes and process discipline, intra and inter-organizational alignments, investment controls, and overall knowledge and understanding of information technology governance. The results of this study further contributed to the body of research by exploring an area with previously limited research or academic focus. Recommendations for practice include additional command and senior leader emphasis on process

development and process discipline, developing useful calculus for IT investment while improving the alignment of IT with strategic objectives, and increasing Service personnel knowledge and understanding of ITG principles and CCA compliance measures. Finally, future research foci entails expanding the sample to include the functional Combatant Commands, expanding the participant pool to include more Service members from the differing Services, and exploring training and education opportunities within Service and Joint level schools or courses.

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"Trust in the Lord with all thine heart;
and lean not unto thine own understanding.
In all thy ways acknowledge him,
and he shall direct thy paths." Proverbs 3:5-6

I dedicate this dissertation to my lovely wife Sylvia. After my retirement from the United States Marine Corps, she set the example pursuing her Baccalaureate degree while working and raising our family. Her dedication and influence have shown what could be accomplished while balancing work and life. Thank you for your unconditional love and standing by me during the long hours and late nights. I love you so very much and am truly blessed to have you at my side.

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Chapter 1: Introduction

Information technology governance (ITG) within the Department of Defense (DOD) is caught between two conflicting internal frameworks. On one side is the requirement to meet the needs of the warfighter in delivery and managing information technology (IT) services. On the other is the statutory guidance on IT investment management per the Clinger-Cohen Act of 1996 (US Congress, 1996). This Act sets the conditions and requirements for IT investment within the federal government. However, the Act is based on private sector methodologies that can be in conflict with DOD mission requirements relative to information systems capacity, confidentiality, integrity, availability, and redundancy.

Further compounding this dilemma are the cultural and behavioral aspects relative to decision making within the information technology governance (ITG) domain. The differing military services educate and train to service-specific standards that can show considerable differences in understanding and addressing ITG. These training differences thus set the stage for competing philosophies among the principal stakeholder groups and may result in conflicts between legislatively directed processes for ITG and operational or strategic requirements to meet emerging geopolitical events under the purview of the Geographic Combatant Commands. Consequently, this may foster situations in which organizations undertake overspending and development of IT capabilities in already strong areas while ignoring or underspending toward IT capabilities in weaker areas.

While IT and information systems (IS) have revolutionized business processes and procedures from a private and public sector perspective (Ahmad, Ghani, & Arshad, 2013; Balocco, Ciappini, & Rangone, 2013, Goosen & Rudman, 2013), it remains incumbent on both private and public sector organizations to accurately capture and employ the benefits of IT or IS

for organizational success. Unfortunately, defining those factors intrinsic to IT or IS that enable organizational success can be challenging (Wu, Straub, & Liang, 2015). Additionally, there can be sociological, cultural, and behavioral factors that underpin the relationship between IT efficacy and business success (Majchrzak, Markus, & Wareham, 2016). These factors can either positively or negatively influence ITG depending on the external and internal cultural and behavioral influences for both the decision makers and organizational stakeholders.

One such factor is the differentiation between private and public sector ITG mechanisms with regard to behavioral and cultural norms within public sector environments (Ahmad et al., 2013; Balocco et al., 2013; Goosen & Rudman, 2013; Min-Seok, Tafti, & Krishnan, 2014; Whitehead, Sarkani, & Mazzuchi, 2011). In contrast to the private sector focus on resource allocation and profit maximization, the public sector centers on providing services that are inherently governmental in nature and that address societal behaviors as a whole (Overeem, 2005). Consequently, public sector ITG mechanisms take on differing forms and processes from their private sector partners with the corresponding changes in relational value and utility among the stakeholder groups (Chun, Sandoval, Arens, Ojo, Janowski, & Estevez, 2011; Coleman & Perry, 2011; Dawson, Denford, Williams, Preston, & Desouza, 2016; Min-Seok et al., 2014; Whitehead et al., 2011).

In an effort to address ITG within the federal government, the Clinger-Cohen Act of 1996 (CCA) was passed by Congress which directed all federal agencies to create and implement Chief Information Officer (CIO) positions (US Congress, 1996). The CIO positions are responsible for four primary activities as delineated within the CCA, the Information Technology Management Reform Act (ITMRA) (Division E), and the Federal Acquisition Reform Act (FARA) (Division D). The aforementioned Acts were signed into law as part of the National

Defense Authorization Act for Fiscal Year 1996 which, subsequently, directs Department of Defense activities (US Congress, 1996).

The first CIO responsibility was to fulfill the advisory role to senior leaders within the federal government wherein CIOs provide advice and guidance on the development and acquisition of IT assets supporting agency mission roles and responsibilities. The second detailed that agency CIOs were responsible for managing risk and ensuring resource maximization within the IT and IS domain. Third, the CIOs were responsible for developing, maintaining, and managing implementation of common IT architectures and frameworks. Finally, CIOs would be responsible for ensuring IT acquisitions and fielding would be in accordance with proscribed performance measurements and to both evaluate and report IT performance on a reliable, consistent, and timely basis (United States Congress, 1996; US Department of Labor, 2018, US Department of Defense, 2006).

Unfortunately, numerous studies conducted by the United States Government Accountability Office (GAO) highlighted deficiencies within agency adherence and execution of CCA (US Government Accountability Office, 2007a; US Government Accountability Office, 2007b; US Government Accountability Office, 2008; US Government Accountability Office, 2012; US Government Accountability Office, 2018). Many of the deficiencies noted by the GAO can be directly attributed to ITG failures at the strategic and operational levels relative to IT strategic alignment and resource allocation (Liu & Hwang, 2003; Nfuka & Rusu, 2013; Whitehead et al., 2011). Consequently, and in spite of legislation specifically directing implementation and evaluation of IT governance, there appears to be a dichotomy between the legislatively directed activities vis-à-vis ITG and the implementation of processes and procedures to effectively manage IT alignment, resource allocation, and ITG efficacy.

Statement of the Problem

The research problem can be found in the dichotomy between employment and execution of private sector ITG practices and the furthering contrast within the Department of Defense relative to the operations community and the IT community. On one hand is the requirement to provide for the nation's defense and achieve mission success through strategic objectives and alignment with national policy (US Department of Defense, 2017a). On the other hand, is the requirement to be fiscally responsible for acquisitions and procurement (Eiband, Eveleigh, Holzer, & Sarkani, 2013; McGrath, 2011; Page & State, 2012) relative to IT (Min-Seok et al., 2014; Nfuka & Rusu, 2013; Whitehead et al., 2011). Compounding this environment is the reality that DOD mission areas tend toward low probability mission sets with high societal/geopolitical impact. These conditions necessitate acquisition and procurement of IT systems that rely heavily on capacity, confidentiality, integrity, availability, and redundancy. Consequently, a state of competing strategic and operational goals can be seen in which the operations community focuses on mission success independently of costs while the IT community focuses on ITG based on private sector models which use a differing calculus for relational attributes between risk management and IT standardization (Amali, Mahmuddin, & Ahmad, 2014; Dawson et al., 2016; Debreceny, 2013; Page & State, 2012; Tonelli et al., 2017; Whitehead et al., 2011).

Purpose of the Study

The purpose of this qualitative study was to examine the ITG phenomenon internal to the Geographic Combatant Commands' decision-making processes and to describe the cultural and behavioral frameworks relative to their influence on ITG and CCA efficacy requirements. A phenomenological approach was used to determine the extent that behavioral and cultural

processes resident in the military operational community affect, counter to statutory regulation, the subordination of ITG processes. The study participant pool included 20 military officers and governmental civilians from both the DOD operations and IT communities within six Geographic Combatant Commands. Data was collected through purposive sampling and semi-structured interviews with members of the Association of the United States Army (AUSA), the Armed Forces Communications and Electronics Association (AFCEA), the Signal Corps Regimental Association (SCRA), and LinkedIn. Finally, secondary data sources were used for triangulation and to further refine data coding and themes.

Theoretical or Conceptual Framework

As functionalism relates to the social and behavioral sciences, it may be considered one of the more appropriate viewpoints of theory when discussing information technology use and governance within the public sector. Although there is limited research within the public sector, and more specifically DOD, there are several studies that can provide context to the research problem with regard to the application and efficacy of ITG (Min-Seok et al., 2014; Whitehead et al., 2011). Additionally, capturing the efficacy of IT investment or the relative benefits of IT's incorporation can become problematic (Barua et al., 2010; Obeidat & North, 2014; Petter, DeLone, & McLean, 2012). Several factors can contribute to the quandary including measuring IT gains, IT's impact on business operations from a cost of ownership perspective, and measuring how IT influences traditional and non-traditional business calculus. ITG can become even more problematic when transitioning from the private to the public sector as the variables take on differing meanings and impacts (Coleman & Perry, 2011; Chun et al., 2011). Consequently, functionalism represents the best theoretical viewpoint for public sector ITG research.

Notwithstanding the concerns noted above, there are several theoretical frameworks worthy of discussion including Stakeholder Theory (STH), Principal Agent Theory, Social Network Theory, Implementation Theory, and Institutional Theory. The aforementioned theoretical frameworks have been used extensively within the ITG field and consistently serve to bound and define the intended research parameters (Majchrzak, Markus, & Waerham, 2016). STH posits the general concept that all members of an organization (stakeholders) have a vested interest in the utility and efficacy of artifacts or organizational processes (Devos & Van de Ginste, 2015). Second, STH provides the underlying structure for balancing competing demands of the organizations various stakeholders (Chan, Watson, & Woodliff, 2014). Finally, STH promotes treating all stakeholders with courtesy, respect, and fairness in organizational decision-making processes. As ITG encompasses the fusion of business strategic goals and the IT applications, the employment of STH provides a solid foundation for ITG research.

Within the context of ITG, STH provides a theoretical framework relative to internal and external organizational actors while incorporating the themes of strategic alignment, IT maturity models, and resource allocation. Additionally, the use of STH allows the researcher to focus on three principal questions: 1) who are the stakeholders; 2) what do stakeholders want; and 3) how do stakeholders influence ITG (Devos & Van de Ginste, 2015). Finally, STH allow the researcher to investigate primary constructs, organizational relationships, scope of ITG efficacy, and causal or approximate correlations (Devos & Van de Ginste, 2015).

Furthermore, strategic alignment is noted by many practitioners as one of the key elements of ITG (Ahmad et al., 2013; Balocco et al., 2013; Goosen & Rudman, 2013; Min-Seok et al., 2014; Whitehead et al., 2011). However, public sector examination of IT strategic alignment has not kept pace with studies conducted within the private sector (Amali et al., 2014;

Nfuka & Rusu, 2013; Tonelli et al., 2017; Whitehead et al., 2011; Wilkin & Chenhall, 2010). Consequently, the relationship differential between private sector stakeholders and public sectors stakeholders has not been fully explored (Al-Farsi & El Haddadeh, 2015; Amali et al., 2014; Nfuka & Rusu, 2013; Tonelli, et al., 2017). Finally, strategic alignment must be viewed contextually through the lens of strategic business decisions coupled with IT requirements among stakeholder groups thus meeting the theoretical framework for STH (Ahmad et al., 2013; Balocco et al., 2013; Goosen & Rudman, 2013; Min-Seok et al., 2014; Tonelli et al., 2017).

However, there are areas of controversy and unanswered questions concerning the use of STH for public sector ITG research. First, cultural and behavioral factors must be addressed with regard to resource allocation and the relationship between ITG and the maximization of organizational resources. Here, ITG nominally serves the functional role relative to decision rights allocation and the fusion of IT with business objectives. This role underpins the relationship wherein ITG can serve to maximize resources while reducing cost throughout the enterprise (Ahmad et al., 2013; Balocco et al., 2013; Debrency, 2013; Goosen & Rudman, 2013; Héroux & Fortin, 2013; Min-Seok et al., 2014; Whitehead et al., 2011). Furthermore, it can be difficult to qualify the effects of ITG on resource allocation given the competing calculus used to establish measures of effectiveness within the public sector (Al-Farsi & El Haddadeh, 2015; Amali et al., 2014; Drnevich, & Croson, 2013; Min-Seok et al., 2014). Given this difficulty, return on investment and total cost of ownership calculations become problematic in determining the relationship between performance and ITG thus inhibiting the STH theoretical framework.

Second, the situation noted above becomes more complex when factored into the decision making process with the DOD. Changing geopolitical dynamics and low probability/high impact events must be included in any resource allocation decision and very few

studies have explored this dynamic (Flournoy & Lyons III, 2016; Guttieri, 2014; Héroux & Fortin, 2013; Lake, 2012). Consequently, there are several unanswered questions relative to employing STH for DOD ITG research. For example, how do stakeholders within differing organizational constructs compete for resources or influence resource allocation outside established ITG channels to meet low probability/high impact events?

Nonetheless, STH remained a viable theoretical construct for the research study. STH supported exploring the interplay of culture and behavior on differing organizational groups within the ITG domain. Additionally, STH allowed for examining the differing stakeholders throughout internal and external organizational constructs and their influence on ITG efficacy. Finally, STH provided the framework for identification and exploration of causal or proximate correlations among the stakeholder groups (Devos & Van de Ginste, 2015).

Nature of the Study

On the surface, the study of IT or IS would appear technically based and, therefore, a quantitative methodology would be preferred. Research on correlation and causality among independent and dependent variables comprise one aspect of the quantitative method; however, IT and IS are only technological artifacts. The juxtaposition of human behavior coupled with culture influence the manner in which IT and IS will be employed (Brown, 2014; Wynn & Williams, 2012). Within this paradigm, a qualitative methodology was best suited within the underlying framework of phenomenology as a qualitative methodology is used to explore, discuss, and understand a central phenomenon (Cresswell, 2013; Krathwohl, 2009; Morgan, Pullon, Macdonald, McKinlay, & Gray; 2017). Through the use of broad and general questions, the researcher can collect detailed and instructive views from the participants via statements, images, and impressions which form the basis for analysis of the context and themes (Cresswell,

2013; Dane, 2011; Krathwohl, 2009). By focusing on the interplay of cultural and behavioral factors, a practical business application can be developed to qualify patterns and impacts on ITG efficacy within DOD organizations. This application then facilitates the decision-making process thereby improving strategic alignment and resource allocation.

A qualitative research design was appropriate for the research study as the focus centered on exploring the cultural and socio-behavioral mores and attitudes of operations and IT professionals within the Geographic Combatant Commands. In contrast, quantitative analysis is statistically oriented focused on determining correlation or causal variables that influence and shape future outcomes (Krathwohl, 2009). Consequently, a qualitative approach more fully allowed the researcher to explore the phenomenon thereby exploring the context and interplay of social dynamics in an environmental setting (Cresswell, 2013; Dane, 2011).

By using phenomenology, the researcher explored the dynamics of culture (implicit and explicit within the participant group), behavior, and the interplay of multiple forces that operate in differing modes depending on the situation at hand. For example, normative ITG is related to strategic goals and objectives thus nesting resource allocation for IT and IS within a traditional outlook (Debreceny, 2013). Within the public sector, and more specifically DOD, this normative role may or may not be followed given the exigencies of external forces (Min-Seok, et al., 2014; Whitehead et al., 2011). These external forces can be geopolitical or social in nature and the relationships established relative to the participant pool influence the decision-making process. Additionally, the cultural and behavioral attitudes serve to construct prioritization frameworks within the two communities. These prioritization frameworks identify means to utilize resources in differing ways and relate directly to how culture and behavior shape ITG. Consequently, the use of a qualitative approach better served examining the interplay among various cultural and

behavioral roles vice attempting to quantify cultural and behavioral independent and dependent variables in a correlative or causality design (Cresswell, 2013; Dane, 2011).

A differing qualitative method that could have been considered for this research study was Grounded Theory (GT). GT originated with Glaser and Strauss and could be considered appropriate for IT and IS research (Venkatesh, Brown, & Bala, 2013). Furthermore, both Creswell (2013) and Dane (2011) noted that GT can be considered a systematic and qualitative procedure that allows researchers the capability to generate a theory which provides an explanation for a process or interaction relative to the research topic. However, the current research study is exploratory in nature and is not focused on developing a theory. Consequently, GT would not be appropriate for this research problem (Hussein, Hirst, Salyers & Osuji, 2014; Suddaby, 2006).

Within the study methodology, semi-structured interviews and secondary data sources were employed. Semi-structured face-to-face or telephonically conducted interviews, based on the protocols concurrent through the research domain (Marshall & Rossman, 2006; Seidman, 2006), were employed for structured data collection. Data collected through the interviews was used to explore themes and patterns in how the participants perceive Clinger-Cohen requirements and subsequent ITG structures (Baxter, & Jack, 2008; Creswell, 2013; Krathwohl, 2009). Finally, secondary sources such the federal government IT Dashboard and related ITG compliance reports contained within federal government websites and portals were used to further refine and triangulate the data coding and themes.

Research Questions

As the resourcing of DOD is through public coffers and directly relates to the expenditures of public funds, increasing ITG and IT efficacy is a natural means to deficit

reduction and good stewardship of public funding. However, the cultural mentality and focus on mission accomplishment within Geographic Combatant Commands can be at odds with the legislatively directed ITG requirements. Therefore, ITG efficacy and ITG mechanisms can be shaped by the cultural and behavioral frameworks resident within differing DOD stakeholder communities of interest. Exploring the phenomena was the primary purpose of the study and the following questions were designed to determine cultural and organizational behavior challenges relative to Clinger-Cohen compliance within Geographic Combatant Commands.

RQ1. To what extent do cultural and behavioral influences on organizational behavior positively or negatively affect Clinger-Cohen compliance within the Geographic Combatant Commands?

RQ2. Under what conditions do age, gender, and Service affiliation of stakeholders within the Geographic Combatant Commands affect ITG?

RQ3: To what extent do cultural and behavioral influences affect IT resource allocation within the Geographic Combatant Commands?

RQ4: How do cultural and behavioral structures within the Geographic Combatant Commands affect IT alignment with strategic objectives?

Significance of the Study

Strategic alignment and resource allocation are two key pillars for effective ITG within the private sector (Balocco et al., 2013; Goosen & Rudman, 2013). However, little research has been conducted on the efficacy of strategic alignment and resource allocation within the public sector (Coleman & Perry, 2011; Dawson et al., 2016; Min-Seok et al., 2014; Whitehead et al., 2011). Additionally, the mediating behaviors and cultural backgrounds of stakeholders within public sector organizations can either positively or negatively influence ITG (Debreceny, 2013;

Page & State, 2012; Tonelli et al., 2017). Within the Department of Defense, a differing calculus is required due to mission requirements and behavioral processes resident in the operational community. This community is focused on successful mission execution and less concerned with the integration of IT and information systems for strategic alignment or resource allocation. Consequently, there is a dichotomy between the operational community and the legislatively directed ITG frameworks found in the CCA. Therefore, ITG decisions with regard to strategic alignment and resource allocation are shaped not by private or public sector ITG models but influenced by the cultural and behavioral mores and actions of differing organizational stakeholder groups.

Within the Department of Defense, over $36 billion dollars was spent on IT investments for both major acquisition and non-acquisition projects. Of this total, $29 billion was allocated to support non-acquisition project categories (IT Dashboard, 2018). This amounts to approximately 6% of the overall budget for the Department of Defense (US Department of Defense, 2017b). As good stewards of public resourcing, members within DOD have an inherent obligation to properly allocate spending with effective resource allocation in mind. However, the mediating influence of culture and behavior can negatively influence both strategic alignment and resource allocation using private sector ITG structures. Therefore, this study investigated the mediating factors resident in ITG bounded by the operational organizations within the Department.

As there has been little research conducted exploring the dynamics noted above, the study adds to the literature relative to public sector ITG while informing senior leaders within the Department of Defense on approaches that can be taken to address CCA efficacy and compliance. If this study were not conducted, operational organizations within DOD may continue to make ITG decisions that are not in keeping with CCA legislative requirements.

Alternatively, this study may inform senior leaders within DOD that revisions to CCA must be developed and implemented. Consequently, the CCA revisions would then be informed by the mediating effects within the operational community and facilitate mitigating the dichotomies between operational requirements for rapidity of action and flexibility of IT solutions sets and CCA ITG frameworks based on private sector models.

Definitions of Key Terms

Establishing a baseline for understanding the terms and definitions used in a study is important (Creswell, 2013). By defining terminology contained in the study, the risk of misinterpretation is minimized. This section identifies terms which provide a common understanding for the research project.

Chief Information Officer. Corporate level officer that is responsible for IT strategy and investment management within an organization. The CIO is also responsible for IT integration and implementation within the organization (Daminescu, 2016).

Geographic Combatant Command. The Unified Command Plan delineates Areas of Responsibility and functional roles for the Geographic Combatant Commanders. Combatant Commanders execute mission command by exercising the lawful authority over subordinates by virtue of rank or assignment (US Department of Defense, 2016).

Information technology governance. "IT governance consists of the leadership and organisational structures and processes that ensure that the organisation's IT sustains and extends the organisation's strategy and objectives" (De Haes & Van Grembergen, 2009).

Operational community. Individuals or groups that plan and execute tactical activities designed to accomplish specific local or theater objectives. The operational community employs a cognitive approach supported by knowledge, skills, experience, and judgment to develop

strategies and campaigns designed to integrate the ways and means of offensive and defensive warfare (US Department of Defense, 2016).

Resource allocation. Activities and functions designed to allocate resources (time, personnel, and funding) within an organizational construct. Resource allocation includes developing budgetary estimates, prioritization of programs and funding, and monitoring the implementation of programs and projects to ensure resources are properly applied and accounted (US Department of Defense, 2006)

Strategic alignment. In IT and IS literature, strategic alignment refers to the alignment of IT to meet strategic objectives of the organization or firm. Strategic alignment thus enables organizations or firms to employ IT or IS to facilitate business strategy and obtain increased performance (Cui, Ye, Teo, & Li, 2015)

Summary

As there has been little research within the public sector on ITG and even less research within the DOD, the study highlighted interesting conclusions and exposed areas wherein differing stakeholder groups influence ITG decision making resulting in limited or marginal Clinger-Cohen adherence. By linking ITG efficacy to cultural mores and behaviors along with levels of IT strategic alignment and resource allocation, the study highlighted areas that can be transformed by effective and efficient ITG. Alternatively, the study should highlight areas for revision of the Clinger-Cohen Act to address the dichotomy between private sector business practices and mission derived operational requirements. Furthermore, the study can be used to extend scholarship within a critical activity of the federal government. As maintaining the nation's offensive and defensive capability is the primary task for the DOD, fiscal stewardship is necessary to remain relevant in today's budgetary environment.

The use of qualitative vice quantitative frameworks might at first seem counterintuitive given the technical and quantitative nature of IT. However, as the phenomena studied focuses on cultural and behavioral mores within DOD decision makers, the use of qualitative research better addressed the problem statement and research questions. In this fashion, the research puts "the meat on statistical bones" (Krathwohl, 2009; p. 237) and move beyond simple correlation or causality.

The phenomenological study framework allowed the research to explore areas outside simple statistical analysis. The interplay of culture and behavior relative to ITG and Clinger-Cohen efficacy encompasses more than the mere technical artifact. The individual and group dynamics shape the employment of IT and IS and this dynamic can easily be influenced by cultural and behavioral patterns. The methodology also provided the opportunity to explore group network and social structures through systems interaction using Stakeholder Theory as the foundational framework.

Chapter 2: Literature Review

The research problem under discussion was found in the dichotomy between employment and execution of private sector information technology (IT) governance (ITG) practices and the furthering contrast within the Department of Defense relative to the operations community and the IT community. On one hand is the requirement to provide for the nation's defense and achieve mission success through strategic objectives and alignment with national policy (US DOD, 2018). On the other hand, is the requirement to be fiscally responsible for acquisitions and procurement (Eiband, Eveleigh, Holzer, & Sarkani, 2013; McGrath, 2011; Page & State, 2012) relative to public sector IT (Min-Seok et al., 2014; Whitehead et al., 2011). However, there is little previous research that corresponds to ITG within the Department of Defense (Whitehead et al., 2011).

Although the amount of private sector research and conceptual framework methodologies may not be as applicable as those noted for public sector, there still are opportunities for exploration. Several elements of the private sector research can apply to the public sector in the areas of strategic alignment and resource management. Similar to the Sarbanes-Oxley Act of 2002 which detailed corporate governance regulations, the Clinger-Cohen Act (CCA) of 1996 applied a similar framework of governance regulation for IT and information systems (IS). Consequently, IT management personnel are accountable for developing and implementing IT solutions that are cost effective and meet overarching agency goals (Whitehead et al., 2011). As there are significant similarities between private and public sector resource management, the use of selected portions of private sector conceptual frameworks could be applicable. For example, Drnevich & Croson (2013) have shown the relationship between ITG efficacy and resource

allocation with regard to transactional economics can also be applied to public sector resource determination and allocation.

Within the Department of Defense (DOD), the first requirement for IT is predicated on the needs of the warfighter in delivering kinetic and non-kinetic effects on the battlefield. Consequently, this requirement is centered on safety of life for American and coalition service members while ensuring lethality of action against enemy combatants. The competing requirement entails executing the statutory guidance on IT investment management per the Clinger-Cohen Act of 1996 (US Congress, 1996). This Act sets the conditions and requirements for IT investment within the federal government. However, the Act is based on private sector methodologies that can be in conflict with DOD mission requirements relative to information systems capacity, confidentiality, integrity, availability, and redundancy.

The purpose of this qualitative study was to explore and understand the decision-making processes and to describe the cultural and behavioral frameworks relative to their influence on ITG and CCA efficacy requirements within Geographic Combatant Commands. Chapter 2 introduces pertinent literature and documentation relative to ITG efficacy within the private and public sector. The first section of the literature review focused on IT governance and structures. The second section focused on private and private and public sector ITG methodologies and practices. The third section focused on the legislation that codified the need for increased governance and oversight of IT investments. The remaining sections discuss the efficacy of strategic alignment and resource allocation relative to ITG within the Department as well as the operational decision-making processes and organizational behavior challenges within the Department of Defense.

The literature review provides a summary of findings and recommendations related to information technology governance, strategic alignment and resource allocation of IT, decision-making processes within the Department of Defense, and both cultural and behavioral aspects resident in the public sector ITG and the DOD. The literature review focused on primary sources resident in scholarly peer-reviewed articles, journals related to IT and organizational behavior, dissertations, and books on research methods and practices. Non-primary sources were used which included GAO reports and testimony before United States House of Representative committees. Searchable databases included EBSCO Host, ProQuest, and Science Direct utilizing the Northcentral University library resources. Additionally, Google Scholar provided opportunities to explore additional works by seminal authors within the ITG field. Table 2.1 lists the categories and search terms used for each category.

Literature Review Categories and Search Terms

Category	Search Terms
Information Technology Governance	Information technology, information systems, governance, governance structures, information and communication technologies, decision rights, private sector information technology governance, public sector, information technology governance, information technology governance Department of Defense, information technology military, governance military, and governance frameworks.
Congressional Legislation and Clinger-Cohen Act	Clinger-Cohen Act, Federal IT Acquisition Reform Act, information technology governance, Information Technology Management Reform Act, and information technology House Oversight.
Strategic Alignment	Information technology, information systems, governance, strategic alignment, information and communication technologies, strategic objectives, organizational goals, strategic business objectives, strategic alignment Department of Defense, strategic alignment military, and business strategy alignment.
Resource Management	Information technology, information systems, governance, resources, resources allocation, information technology investment, information and communication technologies, information technology investment objectives, organizational investment goals, resource allocation Department of Defense, information technology investment management Department of Defense, resources allocation military, and resource allocation business objectives.

Military Decision Making	Decision making Department of Defense, decision making military, decision making Armed Forces, decision making Army, decision making Navy, decision making Air Force, decision making Marine Corps, and decision making Joint Forces
Culture and Behavior	Information technology culture, information systems culture, governance culture, governance behavior, information and communication technologies culture, information technology behavior, information technology organizational behavior, Department of Defense culture, Department of Defense organizational behavior, military culture, and military organizational behavior.

Table 2.1. Literature review search categories and search terms.

Information Technology Governance and Structures

In order to understand ITG and how ITG plays a critical role in today's private and public sector environment, a common definition of ITG must first be established. Defining ITG can take differing personas and one persona can be found in the specification and framework of decision rights and accountabilities designed to foster and encourage desirable IT behaviors (Juiz & Toomey, 2015; Selig, 2016). However, ITG can also be viewed as the business or organizational capacity used by the various senior elements within the organization to control the formulation and implementation of IT strategy thus ensuring the fusion of business and IT (De Haes & Van Grembergen; 2009). As one can see, the underlying construct of the definitions may be similar; however, the particulars highlight distinct differences in both letter and intent. Additionally, De Haes and Van Grembergen and go further and sub-divide IT management and IT governance in which IT management is the efficient and effective delivery of IT and IT governance is the activities that transform IT to meet current and future requirements.

Another defining element relative to ITG are the relationships between IT strategic alignment and resource allocation and associated IT investment processes (Ahmad et al., 2013; Balocco et al., 2013; Debrency, 2013; Goosen & Rudman, 2013; Héroux & Fortin, 2013; Min-

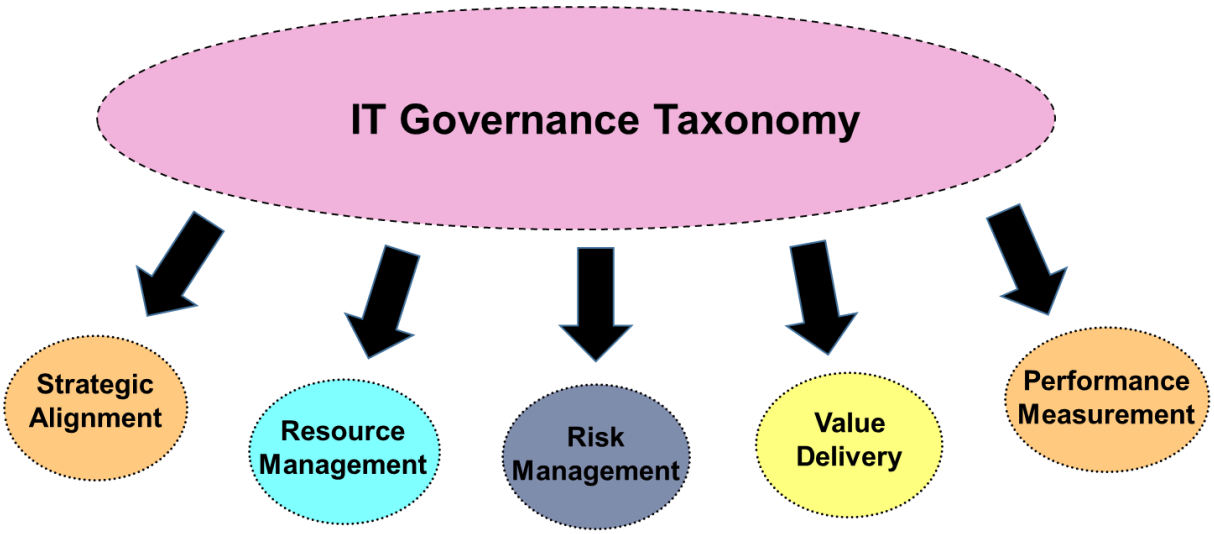
Seok et al., 2014; Whitehead et al., 2011). Ahmad et al. (2013) noted "Decisions in IT investment should be designed to impact favorably the key factors of an organization. Organizations need to strategically assess how the intended IT investment will support the overall aims and interests of the organizations and provides competitive advantage" (p. 30). Additionally, Ahmad et al. (2013) described the financial revenue streams and budgeting as being "… the most important aspects of IT investment" (p. 29).

Furthermore, effective employment of IT and IS can facilitate better business processes while improving productivity or reducing labor costs (Petter et al., 2012). IT and/or IS can also be catalysts for new products or services thus reinforcing the pervasive nature of IT and the implicit and explicit benefits toward mission accomplishment (Barua et al., 2010; Whitehead et al., 2011). Finally, IT serves as a means for integrated organizational messaging and product determination. In this dynamic, IT serves as the foundational element that provides the sender-receiver messaging while allowing for near real-time feedback from external or internal stakeholders via messaging and web based applications (Ramadan & Al-Qirim, 2015).

However, capturing the efficacy of IT investment or the relative benefits of IT's incorporation can become problematic (Barua, et al., 2010; Obeidat & North, 2014; Petter et al., 2012; Selig, 2016). Several factors can contribute to the quandary including measuring IT gains, IT's impact on business operations from a cost of ownership perspective, measuring how IT influences traditional and non-traditional business calculus. Nicho & Khan (2017) noted "In this respect, the objective of continuous measurement of IT processes/IT controls to ensure alignment, plays a critical role in IT business alignment success through higher-level measurement models" thus reinforcing the requirement for relational and environmental measures of effectiveness (p. 82). Finally, efficacy gains can become even more problematic

when transitioning from the private to public sector as the variables take on differing meanings and impacts (Coleman & Perry, 2011; Chun, et al., 2011).

The Information Systems Audit and Control Association (ISACA) developed the IT Governance Institute (ITGI) in 1998 with a mission "To advance international thinking and standards in directing and controlling an enterprise's information technology" (pg. 1). Furthermore, the ITGI noted "IT governance is the responsibility of the board of directors and executive management. It is an integral part of enterprise governance and consists of the leadership and organizational structures and processes that ensure that the organization's IT sustains and extends the organization's strategies and objectives." (ISACA 2018, pg. 2). Within ISACA and the ITGI, IT governance is based on five focus areas including: strategic alignment, resource allocation, risk management, value delivery, and performance measurement. Figure 2-1 denotes the focus areas and IT governance taxonomy.



Information Technology Governance Taxonomy	
Focus Area	**Description**
Strategic Alignment	Provide for strategic direction of IT and the alignment of IT and the business with respect to services and projects.
Resource Management	Provide high-level direction for sourcing and use of IT resources. Oversee the aggregate funding of IT at enterprise level. Ensure there is an adequate IT capability and infrastructure to support current and expected future business requirements.
Risk Management	Ascertain that processes are in place to ensure that risks have been adequately managed. Include assessment of the risk aspects of IT investments.
Value Delivery	Confirm that the IT/Business organisation is designed to drive maximum business value from IT. Oversee the delivery of value by IT to the business, and assess ROI.
Performance Management	Verify strategic compliance, i.e. achievement of strategic IT objectives. Review the measurement of IT performance and the contribution of IT to the business (i.e. delivery of promised business value).

Figure 2-1. Information Technology Governance Taxonomy (ISACA, 2018)

Within the ITG taxonomy, there are multiple system processes that can be used as an ITG framework. The most prevalent frameworks include the Control Objectives for Information and Information related Technologies (COBIT 5), the Information Technology Infrastructure Library (ITIL), and the International Organization for Standards (ISO). COBIT was developed by IT practitioners, which dates back to 1996, and originated as an IT auditing framework. In 2012, COBIT 5 version was released. The COBIT 5 framework supports organizations seeking to achieve business objectives for governance and the management of local or enterprise level IT (Devos & Van de Ginste, 2015). Figure 2-2 highlights the five key principles of COBIT 5 required for successful ITG. Bichal (2017) noted "The COBIT 5 framework is especially well suited because it permits managers to bridge the gaps between control requirements, technical challenges and business risk" (p. 2).

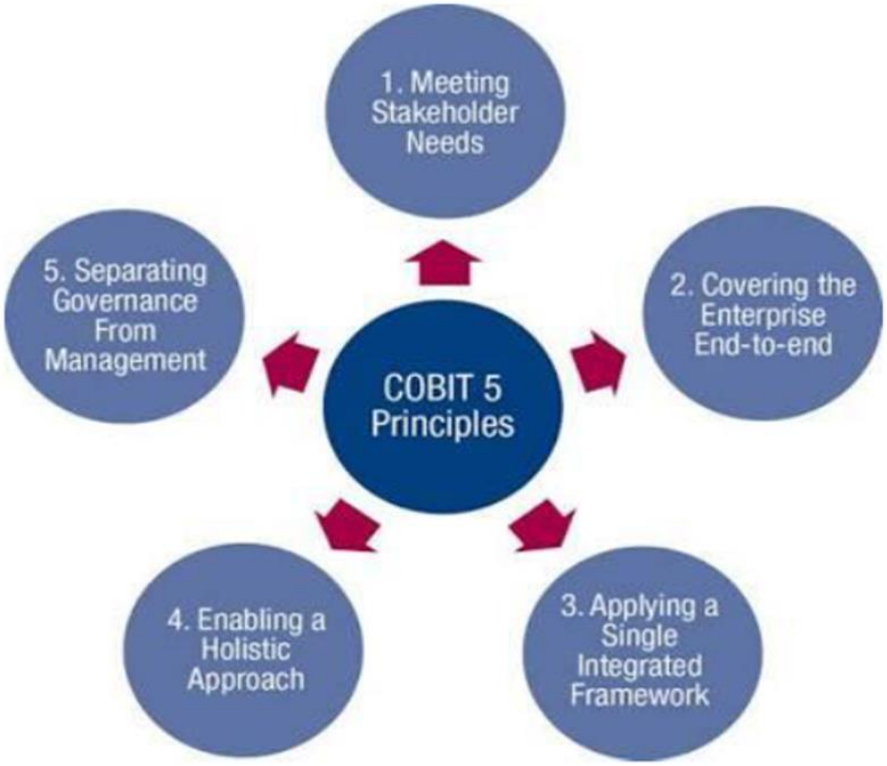


Figure 2-2. COBIT 5 Principles (Bichal, 2017; ISACA, 2018)

The second framework is the Information Technology Infrastructure Library (ITIL). ITIL is the most commonly adopted framework with an estimated 24% saturation rate among businesses and organizations (Ramakrishnan, 2014). ITIL encompasses 25 differing processes and incorporates nearly every task within an IT department (Selig, 2016). Additionally, ITIL will not only affect the IT department staff but every member of the organization as ITIL processes may rearrange internal and external staff processes while increasing rank and file intellectual requirements for ITIL adherence (Iden & Eikebrokk, 2014; Selig, 2016)). Finally, Iden & Eikebrokk (2014) noted "Because ITIL implementation is challenging, a full adoption of the ITIL processes may take years and requires the dedication of managers as well as personnel" (p. 292). Figure 2.3 depicts the categories and processes for ITIL Framework v3.

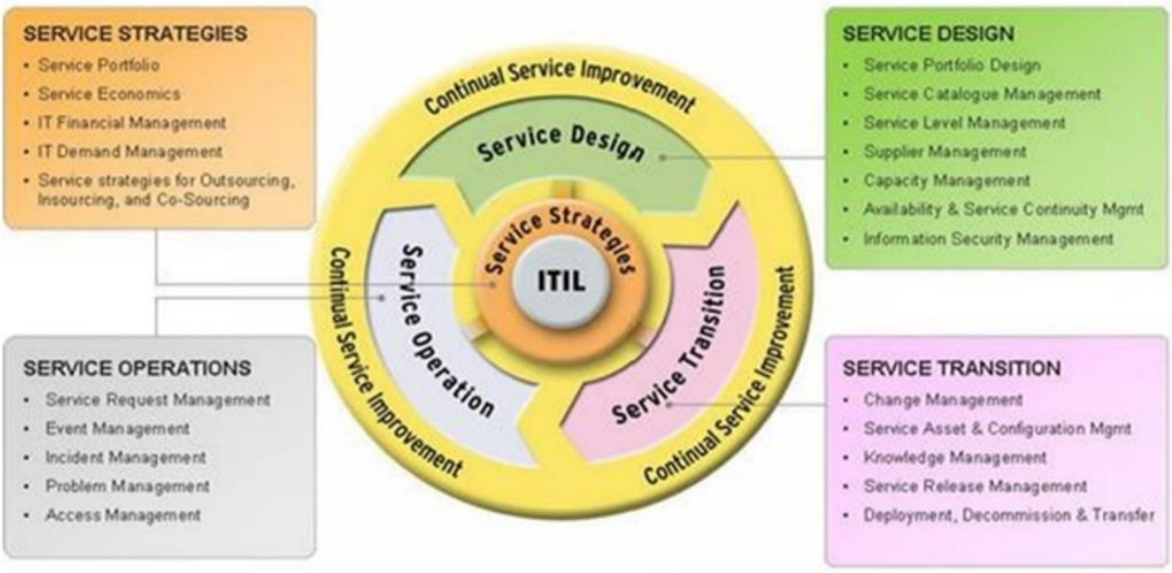


Figure 2-3. ITIL v3 Framework and Processes (Selig, 2016; p. 64)

Notwithstanding the points noted above, ITIL has achieved an adoption rate of 77% among businesses and organizations in the United Kingdom (Ramakrishnan, 2014). Although less in the United States, it is estimated that 57% of companies have adopted some of the ITIL processes (Ramakrishnan, 2014). Additionally, the official ITIL accreditor for certification published statistics wherein the ITIL Foundation exam showed a 100% increase in participation (Ramakrishnan, 2014). Finally, under the information technology service management domain ITIL is the most popular and prevalent framework for ITG (Iden & Eikebrokk, 2014).

The International Organization for Standards (ISO) is the third most prevalent ITG framework employed by businesses and organizations. ISO in a non-governmental independent organization with membership from over 160 national standards bodies and organizations. The central purpose of ISO is to bring together experts to share knowledge and develop consensual market relevant standards for voluntary adoption (ISO, 2018). Within the ITG domain, ISO 38500:2008 has aided business managers and leaders in clarifying and overarching system for

directing and managing IT used within the business unit. In this case, ITG becomes a standards-based framework for resource allocation within the corporate model. As the Chief Executive and Board of Directors has a fiduciary responsibility toward the shareholders, this standard meets corporate governance standards for systems management, IT controls, and IT resource allocation (Mohamad & Toomey, 2016). Table 2.2 denotes the most prevalent ITG frameworks found in empirical research.

ITG frameworks \ Authors	Hardy (2006)	Hill & Turbitt (2006)	Goosen & Rudman (2013)	Gehrmann (2012)	Sahibudin et al. (2008)	Ula et al. (2011)	Heschl (2004)	Sheikhpour & Modiri (2012)	Shivashankarappa et al. (2012)	Aiken et al. (2006)	NĂSTASE et al. (2008)	Latif et al. (2009)	Nicho (2012)	Coleman & Chatfield (2011)	Lawton (2007)
COBIT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ITIL	•	•	•	•	•		•		•	•	•	•		•	•
ISO 27000 series, ISO 38500 & ISO9001	•		•	•	•	•	•	•	•	•	•			•	
FFIEC						•									
CGTF						•									
IISA						•									
CISWG						•									
PCI DSS						•							•		
COSO							•								
Tick IT							•								
NIST							•								
Prince 2							•		•						
CMMI							•		•	•		•			
TQM							•		•	•					

Table 2.2. Most adopted information technology governance frameworks. (Nicho & Muamaar, 2016; p. 4)

However, organizations continue to see challenges implementing ITG frameworks. Although COBIT 5 is one of the more prevalent ITG frameworks, studies have noted that COBIT 5 does not provide enough detail nor explanations relative to implementation processes (Pereira & Mira da Silva, 2012). Additionally, COBIT 5 has been found to require expert knowledge due to complex frameworks and significant interdependencies within COBIT 5 processes (Pereira & Mira da Silva, 2012. Finally, organizations that lack formal business process struggle with COBIT 5 implementation (Nicho & Muamaar, 2016).

Many organizations also struggle implementing ITIL and ISO frameworks. Challenges with ITIL include lack of management commitment, complicated process diagrams, and failures in roles and process owner assignments (Nicho & Muamaar, 2016). Furthermore, customers found dissatisfaction with ITIL due to increased training requirements, lack of awareness for ITIL processes, and complex terminology (Nicho & Muamaar, 2016). Finally, organizations experienced challenges with ISO implementation due to employee resistance to change, complexity, lack of middle management support, and organizational politics (Nicho & Muamaar, 2016; Othman & Chan, 2013)

Public Sector Information Technology Governance

ITG within the public sector assumes differing roles as the strategic alignment and business objectives take on differing dimensions. Within the public sector, the driving force behind public sector ITG is not profit orientated but is focused on the common good thus metrics for ITG success must be refined (Ahmad et al., 2013; Al-Farsi & El Haddadeh, 2015; Amali, et al., 2014; Balocco et al., 2013; Goosen & Rudman, 2013; Min-Seok et al., 2014; Nicho & Muamaar, 2016; Nfuka & Rusu, 2013; Whitehead et al., 2011). For example, the DOD focus on warfighting methodology is radically different than achieving market share in a given domain.

Furthermore, many of the DOD strategic objectives are based on low probability/high impact events that cannot be calculated using traditional methodology. As these events have a high social and/or geopolitical significance, application of ITG mechanisms must support non-traditional IT service applications while maintaining a competitive edge relative to nation-state competitors (Whitehead et al., 2011). Table 2.3 highlights the differences and challenges inherent in public sector ITG.

Issues for IT Initiatives	Characteristics of the Public Sector	Characteristics of the Private Sector
Complexity	'4+ dimensional world (government, citizens, political imperatives and the media)'	'3-dimensional world (shareholders, the organisation and regulatory bodies)'
	'Increasing demand for 'joined up' projects and key services delivered sometimes through intermediaries'	'Projects require consistent IT infrastructure but generally the scope of access is more restricted'
Initiatives	'Emphasis on announcements and initiatives, which can proliferate with little or no integration and prioritisation'	'Market responses drive value related to the integration and prioritisation of initiatives; that is, strategic planning'
Culture	'Make decisions correctly' vs. 'make the right decisions'	'Focus on decision-making related to strategic planning, not political planning'
Learning from experience	'Weak institutionalised learning with ill-defined accountabilities'	'Financial accountability and regulatory compliance demands, which encourage organisational learning'
Risk	'Propensity to focus on managing political risk, rather than operational and financial risk'	'Focus on operational and financial risk'

Table 2.3. Differences between public and private sector information technology governance. (Al-Farsi & El Haddadeh, 2015; p. 92)

Public sector governance and controls can be considered critical for effective ITG. Several studies noted the mediating effects of management controls within both the public and private sectors (Amali, et al., 2014; Benaroch & Chernobai, 2017; Dawson et al., 2016; Cegielski, Bourrie, & Hazen, 2013; Nicho & Muamaar, 2016; Pang, 2014). In the case of differing factors that influence public sector ITG, macro characteristics from the private sector can be contributing factors and the inclusion of private sector ITG frameworks may provide effective governance mechanisms (Dawson et al., 2016). However, that is not always the case

and a competing analysis noted that public sector ITG can become overly bureaucratic thus negatively mediating the private sector framework efficacy (Pang, Lee, & DeLone, 2014).

There have been fewer studies conducted on public sector ITG than those conducted on private sector ITG (Al-Farsi & El Haddadeh, 2015; Min-Seok et al., 2014; Pang et al., 2014). In comparison, there more than 190 studies were conducted relative to IT value within the private sector setting published in Information Systems journals (Pang et al., 2014). As the public sector is financed by tax revenue, IT value and the associated ITG processes require services that are designed to meet stakeholder needs vice those based on private sector free market practices (Min-Seok et al., 2014; Pang et al., 2014). Additionally, Pang et al. (2014) noted that state governments spent approximately 5% of tax revenue on IT whereas businesses spent approximately 3% of sales revenue for similar IT services. Consequently, public sector ITG must continue to deliver services that improve public sector performance while contributing to value creation for stakeholders.

Nonetheless, there are still challenges associated with ITG in the public sector. Weak internal policies and employee resistance to change contribute significantly to ITG efficacy (Al-Farsi & El Haddadeh, 2015). Additionally, determining effective standards and decision rights responsibilities is crucial for ITG success (Al-Farsi & El Haddadeh, 2015; Benaroch & Chernobai, 2017; Min-Seok et al., 2014). Here ITG assumes the same form between private and public sector in ensuring that ITG decisions are based on common criteria relative to stakeholder requirements. Finally, lack of governmental support units for IT management coupled with a lack of collaboration and priorities negatively affect ITG efficacy (Al-Farsi & El Haddadeh, 2015; Min-Seok et al., 2014).

Al-Farsi & El Haddadeh (2015) also noted the extent of the challenges within the public sector are "…considerably broader" (p. 92). This can be seen in the additional transparency and IT investment management accountability requirements found within the public sector (Al-Farsi & El Haddadeh, 2015; Cegielski et al., 2013). Furthermore, the underlying bureaucracy associated with public sector operations can be counter-productive wherein mid-level managers may not have the necessary autonomy to adjust ITG policy to local conditions. Finally, legislative requirements and the changing political climate can lead to increased expectations of ITG success (Al-Farsi & El Haddadeh, 2015; Chun et al., 2011; Min-Seok et al., 2014).

Similar to the private sector, the public sector has adopted many of the best business practices associated with IT service delivery and ITG. Many of these practices are designed to increase productivity, reduce labor costs, and increase value for the firm. Additionally, public sector organizations have implemented IT solutions for administrative functions, record keeping, and delivery of public services such as education, law enforcement, and public safety. Furthermore, public sector organizations have made some efforts to strategically align IT delivery and governance with organizational objectives (Min-Seok et al., 2014).

Consequently, public sector managers and elected officials have the requirement to ensure IT delivers value to the public. However, Min-Seok et al. (2014) noted "…previous studies in the IS field do not provide adequate answers to the question as they do in the private sector setting" (p. 1080). Furthermore, IT implementation processes have not produced adequate results which, in turn, decrease user faith in IT gains or improvements (Tonelli et al., 2017). Lastly, given the differing conditions between private sector and public sector ITG attempts to quantify value additions suffer from inadequate problem framing (Min-Seok et al., 2014; Pang et al., 2014).

Al-Farsi and El Haddadeh (2015) noted additional challenges with ITG in public sector organizations. Among the challenges identified in the meta-analysis were the lack of senior level management support, complexity in systems and processes, limited resourcing for IT infrastructure, low organizational priority, internal and external politics, and a lack of organizational mandate for ITG efficacy. Moreover, two studies noted these barriers increase ad hoc IT service delivery and governance resulting in overspending on IT investment, delays or cancellation of IT projects, and reduced transparency on governmental affairs (Al-Farsi & El Haddadeh, 2015; Amali et al., 2014).

The next area of focus is the relationship between public sector ITG and IT maturity models. Within this domain, maturity models take on differing values based on the relational attributes between risk management, Chief Information Officer (CIO) perception, and IT standardization. While maturity models can be viewed as an indicator for ITG success (Debrency, 2013; O'Leary, 2009) this calculus may not be appropriate given public sector parameters (Whitehead et al., 2011). Notwithstanding the point noted above, the preponderance of the studies indicate a correlation wherein high IT maturity models provide significant organizational benefits over low maturity models (O'Leary, 2009; Pöppelbuß, Niehaves, Simons, & Becker, 2011; Min-Seok et al, 2014).

Configuration management can also indicate low levels of IT maturity coupled with difficulties in achieving sufficient IT gains relative to organizational success (O'Leary, 2009). Poor configuration management techniques and practices can result in increased IT spending relative to investment returns, reduce stakeholder confidence in IT efficacy, and increase the technical complexity relative to IT and IS implementation (Héroux & Fortin, 2013; O'Leary, 2009). Additionally, the relationship between specific entities of the top management team,

including the Chief Financial Officer (CFO) and the CIO can suffer negative consequences resulting in less than optimal IT investment decisions (Schobel & Denford, 2013). Consequently, the viewpoints of senior management toward ITG can range from disinterest to outright hostility (Schobel & Denford, 2013; Min-Seok et al, 2014; Whitehead et al., 2011).

Maturity models can also be seen to negatively affect IT standardization and thus negatively impact resource allocation throughout the private or public sector domain. Low maturity models are typically characterized as models in which IT decisions are not made collectively nor focused on overarching strategic objectives or stakeholder concerns (Wu et al., 2015; Héroux & Fortin, 2013; O'Leary, 2009). Consequently, IT resourcing decisions under the mantle of ITG are not effective toward IT standardization as a whole.

Moreover, lack of ITG contributes to information silos and IT decisions being made to service a small aspect of the organization versus the organization as a whole (Benaroch & Chernobai, 2017). Overcoming this trend through increased maturity models, organizations can achieve greater Return on Investment (ROI) calculations while reducing configuration management issues thus decreasing Total Cost of Ownership (TCO) relative to IT investments (Ahmad et al., 2013; Debrency, 2013; Selig, 2016). Finally, several studies highlighted the ability to standardize IT delivery, maintain adequate configuration management, and reduce TCO provided significantly higher gains than those firms with low IT maturity models (Ahmad et al., 2013; Debrency, 2013; Héroux & Fortin, 2013; Min-Seok et al, 2014; O'Leary, 2009).

Information Technology Governance within the Department of Defense

Unfortunately, there are even less empirical studies relating to ITG within the Department of Defense than those noted for ITG in the public sector. Many of the research articles are GAO reports but there are three studies worthy of discussion. The first study by

Whitehead, Sarkani, and Mazzuchi (2011) focused on maximizing IT investment within the federal government. The study relied heavily upon the legislatively directed agency information reporting which can be found in the Program Assessment Rating Tool (PART) Exhibit 53 via the Office of Management and Budget. Although the study explored federal government investment decisions, there was a considerable focus on the Department of the Navy, Department of the Air Force, and the Department of the Army. Table 2.4 noted the differences between private and public sector organizational performance.

	Private Sector	Federal Agencies
Strategic Goal	Competitiveness	Mission effectiveness
Financial Goal	Profit, growth, market share	Cost reduction, efficiency
Values	Innovation, creativity, good will, recognition	Accountability to public, integrity, fairness
Desired Outcomes	Customer satisfaction (customer pays for product/service)	Stakeholder satisfaction (stakeholder may not pay proportionally for service)
Stakeholders	Stockholders, owners, market	Taxpayers; legislative, executive, and judicial branches
Budget Priorities Defined by:	Customer demand	Leadership, legislators, planners
Justification for Secrecy	Protection of intellectual capital, proprietary knowledge	National security
Key Success Factors	Growth rate, earnings, market share	Best management practices, legislative compliance
	Uniqueness	Sameness, economies of scale
	Advanced technology	Standardized technology

Table 2.4. Differences between public and private sector organizational performance factors. (Whitehead et al., 2011; p. 180)

The study determined there was a causal relationship inferred but not statistically shown between IT investments and higher performing agencies than those in lower performing

agencies. Additionally, the study noted the findings closely mirrored private sector findings examined by previous researchers. Finally, top performing agencies outperformed lesser agencies in the categories of Innovation and Infrastructure thus allowing for continued high risk projects that increased net gains while poising infrastructure for continual replacement thus facilitating agility and productivity. However, the inference within the findings closely resemble the private sector and these may be outside the norm as private sector strategic objectives in many cases do not correspond to public sector. Consequently, IT investment ROI computations could be inaccurate.

As noted earlier, the role of the CIO serves an important purpose within ITG frameworks and several of the GAO reports note CIO functionality as one of the key pillars contained in the Clinger-Cohen Act of 1996. More narrowly defined is the CIO role within the Department of the Navy Medical Corps. Here the second study by Mellott, Thatcher, Roberts, and Carter (2012) noted significant previous research conducted relative to ITG and CIO functional roles but highlighted that no research had been conducted within the field of military medicine.

Their exploratory study centered on the applicability of CIO skills, IT decisional skills, and information skills within the medical CIO community. Additionally, the study noted that interpersonal skills coupled with the skills noted above can be critical success factors for ITG within the military medical field. However, an interesting observation was also made in which the technology strategist role can be separate and distinct from interpersonal and decisional skills sets. Finally, the study found positive correlations between IT decisional skills and information skills along with positive correlations between IT monitoring skills and the technology strategist role Mellott, Thatcher, Roberts, & Carter, 2012).

Finally, the third study by Guttieri (2014) approached ITG and IT utilization within DOD from a differing perspective. Through the lens of civil-military interactions, Guttieri highlighted technological improvements which resulted in increased capability during disaster operations. By incorporating communities of practice, military and civilian organizations are able to more effectively collaborate to solve complex problems. Guttieri noted "…that many non-governmental organizations are cautious about cooperation with the military, the portal was commercial, with a '.org' address, to promote information sharing" (p. 8). This paradigm shift resulted in improved communication and collaboration during a major military exercise conducted in the Pacific in 2000 (Guttieri, 2014).

Congressional Legislation and Clinger-Cohen Act of 1996

Congress has the inherent authority to develop and promulgate laws for the country. These laws, or statutes, serve and the binding elements for federal agency construct and conduct. As such, Congress has the greatest ability and capability to control agency actions and conduct. The first element is the crafting of enabling legislation and statutory requirements which provides the framework for legislative control of agency construct (Shapiro & Wright, 2011; Staszewski, 2012). Second, is overall control of the budgetary process which allows Congress to continue current agency funding streams, reduce funding amounts thus limiting agency capacities, or increase funding to allow for agency growth and expansion (Pasachoff, 2016). And finally, Congress sets overarching agency policy objectives that influence future regulatory policy actions thus binding agency discretion those measures which meet the statutory requirements (Rubin, 2018; Seinfeld, 2010).

The resultant Information Technology Management Reform Act (ITMRA) and the Clinger-Cohen Act of 1996 served to establish congressional oversight of IT investment

spending within the federal government. The Act was designed using private sector IT governance processes with the intent to scope agency IT acquisition and fielding. There are four significant elements within the CCA including the development and appointment of a senior executive position known as the Chief Information Officer. The second and third elements mandate risk management and IT investment management processes consistent with private sector business models. Finally, the CCA proscribed IT acquisition and program management performance monitoring and reporting (United States Congress, 1996; US Department of Labor, 2018, US Department of Defense, 2006). Table 2.5 further describes the legislative elements.

Functional Requirements of the Clinger-Cohen Act and the Information Technology Management Reform Act (ITMRA) of 1996

Legislatively Directed Action	Description
Establish Agency Chief Information Officer Position	The CIO would be the top-level executive. Provide strategic insight into how IT could integrate private sector business processes to fuse strategic objectives with IT capabilities.
Chief Information Officer Advisory Role	Provide advice and guidance to senior Department of Defense leadership on the development and acquisition of IT assets supporting agencies mission roles and responsibilities.
Chief Information Officer Risk Management Role	Responsible for managing risk . Risk management would be delegated to sub-agency head levels and would incorporate the overall strategic direction of the organization or agency.
Chief Information Officer Investment Management Role	Responsible for ensuring resource maximization within the IT and IS domain. IT investment processes should provide frameworks for the selection of investment utilizing minimum criteria on investment determination and approval while establishing methods to provide senior management the ability to obtain timely information on cost, capability of the system to meet requirements, timeliness, and quality.
Chief Information Officer Architecture Framework Role	Responsible for developing, maintaining, and managing implementation of common IT architectures and frameworks. The Department of Defense (DOD) Architecture Framework (DODAF) was developed to support commonality of terms, processes, and layered architectual views.
Chief Information Officer Performance Measurements	Responsible for ensuring IT acquisitions and fielding would be in accordance with proscribed performance measurements. Evaluate and report IT performance on a reliable, consistent, and timely basis. Additionally, Agency heads shall ensure IT performance measurements would measure how well IT supports agency programs.

Table 2-5. Functional Requirements of the Clinger-Cohen Act and the Information Technology Management Reform Act (ITMRA) of 1996 (US Department of Defense, 2006)

Congressional oversight of IT investment management and resourcing continues to remain a top priority. Testimony in 2013 before the United States House of Representatives Oversight Committee noted that program failures and cost-overruns can be found in over three

quarters of large federal IT programs and acquisitions. Additionally, federal managers claim that more than 47% of their respective budgets are expended to operate and maintain either obsolete or deficient IT equipment and software (US House of Representatives Oversight Committee, 2013). Furthermore, projected estimates suggest that more than $20 billion dollars in tax revenue is squandered by the federal government each year (US House of Representatives Oversight Committee, 2013). Two significant examples were noted during the hearing in which the United States Air Force announced that a $1-billion-dollar logistical system had failed and the project was being cancelled with little to show for the expenditures. The second noted the Department of Agriculture had expended $94 billion dollars to develop a supply-chain management system without ever completing the system (US House of Representatives Oversight Committee, 2013)

The 2013 Oversight Committee included testimony from the Honorable Thomas Davis, former member of Congress and Chairman of the Government Reform Committee, and Mr. Steven VanRoekel, Chief Information Officer for the Office of Management and Budget. Mr. Davis testified that:

> The government's approach to buying IT systems is problematic in that it often tries to do too much at once. Instead of setting out upon the mammoth task of procuring a system worth hundreds of millions of dollars, it might be better to do things in smaller pieces. If something goes wrong with a component of a large implementation, the whole effort can begin to crumble, and instead of ending up with a super system that does everything, we get a pile of worthless technological rubble. It would be better to break things up into smaller chunks and make sure they work before going on to other steps. This is the way private industry works –

> government should move in this direction as well. (US House of Representatives Oversight Committee, 2013)

Mr. VanRoekel testified that the federal government had to improve on the Return on Investment for IT programs and projects in order to be successful over the upcoming years. Additionally, the federal government must move away from a hardware and software IT centric framework to one where IT is considered a service commodity similar to water or electricity (US House of Representatives Oversight Committee, 2013).

Information Technology Management Reform Act and Clinger-Cohen Act Compliance

The United States Government Accountability Office (GAO) has released numerous studies that highlight the deficiencies of government agency to properly govern, manage, and execute IT investment management and deployment. As far back as 1995, GAO noted deficiencies within DOD on effective IT governance and investment management and specifically noted that DOD's business modernization program was considered high risk and remained in the same condition through 2007 (US Government Accountability Office, 2007a). The 2007 report also noted that DOD had not fully defined or documented many IT governance frameworks or processes. Furthermore, the report clearly indicated that the DOD had only fully defined four of nine key practices for project-level processes (US Government Accountability Office, 2007a).

From an IT investment perspective, the 2007 GAO report noted DOD had not fully documented policies and practices for five key IT investment management best practices. For example, DOD had not defined processes and procedures for IT investment selection, acquisition, and funding processes were to be coordinated across the differing components. Additionally, DOD was deficient in specifying the full range and cost of programs; describing

how selection criteria and funding decisions were integrated at the agency level; and providing sufficient oversight and visibility into component level investment management activities (US Government Accountability Office, 2007a). Table 2.6 noted the overall scoring by stages.

Policies and Procedures for Project-Level and Portfolio-Level Management			
Stage 2: Building the investment foundation	**Key practices executed**	**Stage 3: Developing a complete investment portfolio**	**Key practices executed**
Instituting the investment board	1/2	Defining the portfolio criteria	1/2
Meeting business needs	1/1	Creating the portfolio	0/1
Selecting an investment	0/3	Evaluating the portfolio	0/1
Providing investment oversight	0/1	Conducting postimplementation reviews	0/1
Capturing investment information	2/2		
Overall	**4/9**		**1/5**

Table 2-6. United States GAO reporting for IT Investment and Portfolio Management within the DOD (US Government Accountability Office, 2007a).

Following the trends noted above, GAO released another report in 2012 that highlighted continuing deficiencies in DOD IT governance (US Government Accountability Office, 2012). More specifically, the report noted that DOD needed to take more direct action in improving IT governance for IT business system acquisition and fielding coupled with IT modernization activities. For example, although the GAO noted improvements in DOD IT architecture development the report noted that DOD had not fully realized a streamlined and modernized business systems environment (US Government Accountability Office, 2012). Additionally, GAO highlighted that IT governance problems were compounded by the lack of sufficient staffing and manning at the agency level (US Government Accountability Office, 2012). Table 2.7 notes the GAO findings.

US Government Accountability Office Report 12-685	
Focus Area	**Finding**
Architecture Development	DOD has released its most recent business enterprise architecture version. However, the architecture has not yet resulted in a streamlined and modernized business systems environment, in part, because DOD has not fully defined the roles, responsibilities, and relationships associated with developing and implementing the architecture.
IT Business System Modernization	DOD has included information for 1,657 business system investments in the fiscal year 2013 budget submission; however, it does not reflect about 500 business systems, due in part to the lack of a reliable, comprehensive inventory of all defense business systems.
IT Investment Management Framework	DOD has not implemented key practices from GAO's Information Technology Investment Management framework since GAO's last review in 2011. DOD has reported its intent to implement a new organizational structure and guidance to address statutory requirements, this structure and guidance have yet to be established.
Staffing	DOD lacks the full complement of staff it identified as needed to perform business systems modernization responsibilities. Specifically, the office of the Deputy Chief Management Officer, which took over these responsibilities from another office in September 2011, reported that 41 percent of its positions were unfilled.

Table 2-7. United States GAO reporting for governance mechanisms for implementing management controls within the DOD (US Government Accountability Office, 2012).

Clinger-Cohen Act and Federal IT Acquisition Reform Act Compliance

Although reporting from 2007 to the present shows some improvements, overall the DOD continues to languish behind other agencies in meeting CCA and subsequent Federal IT Acquisition Reform Act requirements (US Government Accountability Office, 2018). In 2014, Congress passed the Federal IT Acquisition Reform Act (FITARA) in an effort to increase IT governance efficacy and rectify previous gaps in the CCA. FITARA was designed to streamline IT acquisition processes, increase the authority and decision-making capability of agency CIOs, and reduce the number of agency CIOs so that only one CIO was in a decision-making role. Finally, FITARA reinforced the use of private sector best business practices as a means to increase IT acquisition efficacy and reduce IT procurement waste within the federal government (US Congress, 2014).

Congressional oversight testimony and the GAO report in 2018 highlight the continued struggle within federal government, and specifically DOD, to fully realize ITG efficiencies in strategic alignment, IT investment management, and resource allocation (US GAO, 2018a; US GAO, 2018b; US House of Representatives Oversight Committee, 2018a). The US House of Representatives Oversight Committee conducted hearings in 2018 on the efficacy of meeting FITARA and the results of the legislatively directed 6.0 scorecard. Within this scorecard, DOD received a marginally passing grade in Enhanced Transparency and Improved Risk Management (26% in May 2018) but failing grades in Incremental Development (8% in May 2018), Portfolio Review (0.9% in May 2018), Federal Data Center Optimization (20% in May 2018), and Software Licensing (US House of Representatives Oversight Committee, 2018b). Here DOD only partially complied with conducting a complete inventory and using the results of the inventory to inform IT investment management and resource allocation decisions (US House of Representatives Oversight Committee, 2018b)

During the Oversight Committee session, The Honorable Mr. Dana Deasy (DOD CIO) provided this testimony on DOD compliance with enhanced transparency and improved risk management "My staff is having discussions with OMB and GAO to help ensure that GAO has a complete set of risk data for their analysis. This should result in a more accurate score for DoD in this area" (US House of Representatives Oversight Committee, 2018c; p. 2). Mr. Deasy went on to note that his private sector background and experience should provide the appropriate level of business experience to adequately meet the legislatively directed requirements of both CCA and FITARA. Finally, Mr. Deasy concluded his remarks by stating "I want to emphasize the importance of our partnerships with Congress, the Federal CIO and OMB in these areas. I

anticipate making the key components of FITARA an important focal point during my tenure as the DoD CIO" (US House of Representatives Oversight Committee, 2018c, p. 3).

Based on reporting by both GAO and the Federal IT Dashboard, the federal government plans to invest over $95 billion dollars in IT products and services within 2018 (IT Dashboard, 2018; US Government Accountability Office, 2018a). For fiscal year 2018, the DOD allocated $36 billion dollars for IT investments for both major acquisition and non-acquisition projects (IT Dashboard, 2018). Of this total, approximately $29 billion was allocated to support non-major acquisition project categories (IT Dashboard, 2018). This category is used to depict service projects and programs and includes the services' operations and maintenance budgets. However, as shown earlier these IT investments have, in many cases, failed to follow legislative and regulatory guidance which resulted in IT acquisition inefficiencies, overspending for IT products and services, and failed to significantly contribute to mission-related outcomes (US Government Accountability Office, 2018a).

Finally, the 2018 US GAO Report 18-566T entitled *Continued Implementation of High-Risk Recommendations Is Needed to Better Manage Acquisitions, Operations, and Cybersecurity* continued to highlight ITG failures within the federal government. This report provided a comprehensive scorecard of 24 agencies (of which DOD was included) covering such categories as CIO responsibilities, IT contract approval, federal data center consolidation, and software licensing. The report also provided examples wherein legislatively directed ITG processes and procedures were not followed and which resulted in either significant IT costs or an unfielded IT capability. Within the DOD, the Expeditionary Combat Support System was cited in which the program was cancelled in 2012 after spending more than $1 billion dollars and failing to field the system within five years of funding obligation (US Government Accountability Office, 2018b).

Information Technology Governance and Strategic Organizational Alignment

Strategic organizational alignment is noted by many practitioners as one of the key elements of ITG (Ahmad et al., 2013; Balocco et al., 2013; Goosen & Rudman, 2013; Min-Seok et al., 2014; Whitehead et al., 2011). Not only does ITG, when properly aligned with strategic and operational organizational goals, increase business value but reduces cost center overhead while increasing productivity (Cui, Ye, Teo, & Li, 2015; (Liu & Hwang, 2003; Wagner, Beimborn, & Weitzel, 2014). Additionally, a shared understanding between the CIO and other C-level executives has been shown to enable more effective resource allocation and set the conditions to quickly respond to internal and external challenges (Cui et al., 2015). Finally, aligning ITG and IS with business objectives increases sales and innovation within organizational business units (Cui et al., 2015).

Within the strategic alignment domain, there are many studies that highlight how ITG, when properly aligned to strategic business objectives, yield greater results than when misaligned (Ahmad et al., 2013; Al-Farsi & El Haddadeh, 2015; Amali, et al., 2014; Balocco et al., 2013; Goosen & Rudman, 2013; (Liu & Hwang, 2003; Min-Seok et al., 2014; Nicho & Muamaar, 2016; Nfuka & Rusu, 2013; Whitehead et al., 2011; Wilkin & Chenhall, 2010). Wilkin & Chenhall (2010) completed a thorough meta-analysis of ITG published research. The analysis primarily focused on research studies published in scholarly journals such as *Management Information Systems*, *Management Accounting*, *Accounting Information Systems*, and *Information Systems*. Their multidisciplinary approach highlighted the focus on strategic alignment, resource allocation, and performance management as critical elements for ITG success. Of the 496 research papers reviewed, 152 focused on strategic alignment (30.6%), 113

on resource allocation (22.7%), and 102 on performance management (20.5%). Table 2.8 denotes the functional composition of the meta-analysis.

Overview of Articles Reviewed from Selected IS, AIS, and MA Journals

Number of Articles in the Respective Journal for Each Focus Area

Journal	Strategic Alignment	Resource Management	Risk Management	Value Delivery	Performance Measurement	Governance	Total
MIS Quarterly	10	22	2	9	3	1	47
IBM Systems Journal	6	5	1	1	—	2	15
Journal of Management Information Systems	20	9	11	8	9	—	57
Communications of the ACM	13	16	11	7	2	—	49
Information & Management	19	8	3	6	2	2	40
Information Systems Research	7	1	1	2	7	—	18
Journal of Strategic IS	17	4	2	8	—	2	33
Sloan Management Review	45	23	5	7	6	1	87
Journal of Information Systems	—	*4*	*7*	*2*	*5*	—	*18*
International Journal of Accounting Information Systems	*4*	*4*	*3*	*8*	*1*	*3*	*23*
Accounting, Organizations and Society	**5**	**8**	**7**	**—**	**29**	**—**	**49**
Management Accounting Research	**6**	**9**	**7**	**—**	**38**	**—**	**60**
Total	152	113	60	58	102	11	496

Roman = IS Journals (including MIS); *Italic* = AIS Journals; and **Bold** = MA Journals.

Table 2.8. Overview of articles reviewed during multidisciplinary research (Wilkin & Chenhall, 2010; p. 109).

Furthermore, ITG and strategic alignment are more closely linked in organizations with higher corporate governance maturity levels (Joshi, Bollen, Hassink, De Haes, & Van Grembergen, 2018). Corporate governance maturity levels also influence the operational alignment of IT (Wagner et al., 2014). Ultimately, the primary objective of ITG is to create synergies between IT and IS and the overall organizational goals relative to business value (Altemimi & Mohamed Shanudin, 2015). Consequently, enterprise governance addresses the policies and processes necessary to create business value within the organization from IT enabled investments (Joshi et al., 2018).

However, improving ITG does not necessarily increase strategic alignment realization within organizations. If the organizational understanding of IT value is not fully matured, the

linkage between strategic alignment and ITG can falter (Hiekkanen, Pekkala, & Collin, 2015). Additionally, IT and the associated ITG processes must both inform and be informed by the strategic direction and objectives within the organization. Finally, social and cultural biases inherent in business units and IT units can negatively impact ITG and strategic alignment within the organization (Hiekkanen et al., 2015).

Moreover, operational alignment of IT is closely linked to strategic alignment in the success of ITG framework efficacy (Altemimi & Mohamed Shanudin, 2015; Liu & Hwang, 2003; Wagner et al., 2014; Wu et al., 2015). Here operational alignment of IT refers to operational integration of IT at the subordinate layers of an organization or business. Additionally, operational alignment linkages closely mirror the Strategic Alignment Model posited by Henderson and Venkatraman (1999). Finally, Wagner et al., (2014) findings infer that operational alignment is as important as strategic alignment for ensuring quality IT service and management delivery.

However, public sector examination of strategic alignment has not kept pace with studies within the private sector (Amali, Mahmuddin, & Ahmad, 2014; Nfuka & Rusu, 2013; Tonelli, et al., 2017; Whitehead et al., 2011; Wilkin & Chenhall, 2010). Consequently, the relationship differential between private sector stakeholders and public sectors stakeholders has not been fully explored (Al-Farsi & El Haddadeh, 2015; Amali, et al., 2014; Nfuka & Rusu, 2013; Tonelli, et al., 2017). Furthermore, strategic alignment must be viewed contextually and through the lens of both strategic business decisions coupled with IT requirements and associated technical capacity (Ahmad et al., 2013; Balocco et al., 2013; Cegielski et al., 2013; Goosen & Rudman, 2013; Min-Seok et al., 2014; Tonelli, et al., 2017).

One final strategic alignment factor relative to public sector ITG that must be addressed is the changing geopolitical dynamic. What may be considered important today may not enjoy the same priorities a year from now. This contrasts significantly within the private sector as strategic objectives may remain relevant for many years with resource allocation and ITG focused on achieving gains within a clear objective state (Goosen & Rudman, 2013; Cegielski et al., 2013; Whitehead et al., 2011). This changing dynamic can also cause public sector IT investment and management to experience a condition known as 'IT investment for IT's sake' (Ahmad et al., 2013; Min-Seok et al., 2014). This can occur when the CIO is a technical individual and whom views the problem set through a technical vice strategic organizational lens. Consequently, public sector ITG must not only focus on the fusion of IT and business or stakeholder objectives but also embrace new and emerging mission activities that serve to set conditions for future success (Debrency, 2013; Guttieri, 2014; Frunzeti, 2013).

Information Technology Governance and Resource Allocation

Another defining element relative to ITG are the relationships between strategic alignment of IT coupled with resource allocation and the IT investment processes (Ahmad et al., 2013; Balocco et al., 2013; Debrency, 2013; Goosen & Rudman, 2013; Héroux & Fortin, 2013; Min-Seok et al., 2014; Whitehead et al., 2011). Effective employment of IT and IS can facilitate better business processes while improving productivity or reducing labor costs (Petter et al., 2012). IT and/or IS can also be catalysts for new products or services thus reinforcing the pervasive nature of IT and the implicit and explicit benefits toward mission accomplishment (Barua et al., 2010; Min-Seok, et al., 2014).

However, capturing the efficacy of IT investment or the relative benefits of IT's incorporation can become problematic (Barua et al., 2010; Obeidat & North, 2014; Petter et al.,

2012). Several factors can contribute to the quandary including measuring IT gains, IT's impact on business operations from a cost of ownership perspective, and measuring how IT influences the traditional and non-traditional business calculi (Bakshi, 2017). Understanding the potential benefits and complexities of ITG can become even more problematic when transitioning from the private to public sector as the variables take on differing meanings and impacts (Chun et al., 2011; Coleman & Perry, 2011; Dawson et al., 2016).

Additionally, one must not confuse private and public sector ITG investment processes as public sector institutions exist to serve a common good versus traditional market factors (Min-Seok, et al., 2014; Nfuka & Rusu, 2013; Whitehead et al., 2011). These differing parameters can serve to complicate deriving value added IT and/or IS solutions coupled with the difficulty in determining success metrics across public sector organizations (Amali et al., 2014; Barua et al., 2010; Chun et al., 2011; Dawson, et al., 2016; Nfuka & Rusu, 2013; Petter et al., 2012; Tonelli et al., 2017). However, Dawson, Denford, Williams, Preston, and Desouza (2016) showed statistically significant results for higher performing IT organizations that employed private-sector like hierarchal organizations to mediate IT investment and implementation Consequently, ITG for the public sector must assume differing parameters relative to strategic alignment, maturity models, and resource allocation but can still incorporate private sector modeled practices (Amali, et al., 2014; Dawson et al., 2016; Nfuka & Rusu, 2013; Tonelli et al., 2017).

Another area for consideration is the relationship between the Chief Information Officer (CIO) and the Top Management Team (TMT) which includes the Chief Executive Officer (CEO), the Chief Operating Officer (COO), and the Chief Financial Officer (CFO). The relationships and behavioral dimensions play a pivotal role in the efficacy of ITG. As the role of the CIO is normally filled by a member of the IT community, in many cases this individual can

be viewed as a technical vice business expert thus negating potential gains through a peer relationship and negatively impacting stakeholder returns (Ahmad et al., 2013; Goosen & Rudman, 2013; Mellott et al., 2012; Schobel & Denford, 2013). The dynamic among differing relational groups can be further compounded within the public sector domain as shareholder returns cannot be calculated solely on business or strategic performance (Ahmad et al., 2013; Goosen & Rudman, 2013; Mellott et al., 2012; Schobel & Denford, 2013). The changing dynamic relative to the public sector can result in less than optimal performance in meeting public necessities through ITG (Ahmad et al., 2013; Goosen & Rudman, 2013; Mellott et al., 2012; Schobel & Denford, 2013).

Schobel & Denford (2013) conducted a study to assess the effect of relationships between the Chief Financial Officer (CFO) and the CIO with regard to how said relationships effected ITG and resource allocation. More specifically, the study looked at structural engagement, personal congruence, role effectiveness and strategic alignment. An ethnographic multiple case study design was used with three organizations identified for the case study. The case study design was chosen as it has been cited as an effective means to generate theory for early research problem sets. Additionally, they cited that case study research leads to theories that are testable and empirically valid (Schobel & Denford, 2013).

The study findings did indicate that an effective relationship between the CFO and the CIO was crucial for organizational success and effective ITG. Trust and shared understanding were highlighted as two key elements within the partnership and, when absent, influence techniques became the norm. The study contributions are three-fold: 1) There is a paucity of academic research relative to ITG and the CFO-CIO relationship; 2) Proximity of workplace and functions between the CFO and CIO indicated a higher level of ITG efficacy; and 3) Role

understanding between the CFO and CIO had an impact on relations and, consequently, strategic efficacy (Schobel & Denford, 2013).

Finally, the role and competencies of the CIO must be taken into consideration. Here one recent study was conducted under the premise of determining how the background and education of CIOs can positively or negatively affect public sector ITG (Daminescu, 2016). Although more of a 'think piece' than an actual methodological study, the author noted cultural and behavioral aspects such as the ability to collaborate with a broad range of stakeholders and to operate on both a technical and strategic level (Daminescu, 2016). Although not controversial, the study does provide a view into areas where the DOD may not be adequately focusing attention or training.

The CIO role within DOD was more specifically researched by Messrs. Mellott, Thatcher, Roberts, & Carter (2012). The study noted previous research conducted relative to ITG and CIO functional roles but highlighted that no research had been conducted within the field of military medicine. The exploratory study centered on the applicability of CIO skills, IT decisional skills, and information skills within the medical CIO community. Similar to the findings by Daminescu (2016), interpersonal skills coupled with the skills noted above can be critical success factors for ITG within the military medical field (Mellott et al., 2012). However, it would be specious to infer that Medical Corps related CIO competencies and efficacy can be juxtaposed over Geographic Combatant Commands requirements thus differing requirements and calculus must be used to analyze ITG and Clinger-Cohen efficacy.

Cultural and Behavioral Factors Relative to Resource Allocation

Cultural and behavioral factors must also be addressed with regard to resource allocation and the relationship between ITG and the maximization of organizational resources. Here, ITG

serves the functional role relative to decision rights allocation and the fusion of IT with business objectives and underpins the relationship wherein ITG can serve to maximize resources while reducing cost throughout the enterprise (Ahmad et al., 2013; Bakshi, 2017; Balocco et al., 2013; Debrency, 2013; Goosen & Rudman, 2013; Héroux & Fortin, 2013; Min-Seok et al., 2014; Whitehead et al., 2011). However, it can be difficult to qualify the effects of ITG on resource allocation given the competing calculus used to establish measure of effectiveness (Al-Farsi & El Haddadeh, 2015; Amali, et al., 2014; Drnevich, & Croson, 2013; Min-Seok et al., 2014). Given this difficulty, ROI and TCO calculations become problematic in determining the relationship between performance and ITG. This situation can easily become more complex when factored into the decision making process with the DOD. As noted earlier, changing geopolitical dynamics and low probability/high impact events must be included in any resource allocation decisions and very few studies have explored this dynamic (Flournoy & Lyons III, 2016; Guttieri, 2014; Héroux & Fortin, 2013; Lake, 2012).

Given the environmental factors associated with public sector ITG, organizational management and leadership can experience significant challenges developing and implementing IT based on vague or nebulous requirements (Iden & Eikebrokk, 2014; Korpelainen & Kira, 2013; Lanto Ningrayati, Lillyan, Sitti, 2018; Min-Seok et al., 2014; Whitehead et al., 2011). As noted earlier, public sector goals and objectives can differ significantly from the private sector thus creating situations where defining actionable IT requirements can become problematic (Iden & Eikebrokk, 2014; Korpelainen & Kira, 2013; Min-Seok et al., 2014; Whitehead et al., 2011). One factor that can assist senior leadership is focusing beyond standardized organizational or agency requirements and embracing a whole of government approach to ITG. This allows senior management to collaboration across a broad spectrum of stakeholders to meet both standardized

and unique mission requirements (Chun et al., 2011; Korpelainen & Kira, 2013; Min-Seok et al., 2014; Whitehead et al., 2011). This is not to infer that a whole of government approach can solve all mission determinant IT requirements but simply to increase the narrative across multiple stakeholder communities and domains.

Finally, an important consideration to note is similar trending between the sub-topics relative to research methodology. In many cases, Likert studies are used with the participant pool comprised of IT and business professionals (Amali, et al., 2014; Dawson, et al., 2016; Min-Seok et al., 2014; Pang, 2014; Tonelli, et al., 2017). Resource allocation shows the same tendencies with the principal difference centered on the inclusion of financial managerial staff with IT professionals. This is one of the few areas where the findings are contradictory relative to ITG. For example, isolating ITG from other positive aspects of IT diffusion can negatively influence causal relationships and skew resource allocation calculus (Drnevich, & Croson, 2013; Dehning, & Richardson, 2002). However, ITG has been shown to increase ROI and organizational performance across many of the domains (Ahmad et al., 2013; Balocco et al., 2013; Dawson, et al., 2016; Debrency, 2013; Héroux & Fortin, 2013; Schobel & Denford, 2013; Tonelli et al., 2017). One reason for the contradiction can be inferred due to the nature of the parameters and linkages between organizational performance and resource allocation modeling.

Operational Decision Making within the United States Military

Operational decision making within the Armed Forces can be considered both an art and a science, albeit with more emphasis on art vice science (Vego, 2018). However, that should not detract from the deliberative nature of the planning and operational process. Within the operational planning and decision-making construct, several elements can be characterized as crucial for success. The first is a comprehensive grounding in service and joint doctrine as a

means to facilitate understanding and awareness at the strategic, operational, and tactical levels of warfare (Grigsby et al., 2011; US Department of Defense, 2017b).

This grounding in doctrine enables the commander's inherent capabilities of courage, judgement, intuition, and situational awareness to consider the operational environment and integrate all aspects to render timely and insightful decisions in complex environments (US Department of Defense, 2017b). Additionally, the grounding in doctrine provides the framework for the exercise of command authority through internal and external visualization, the decision-making process, and effective leadership (Pilarski, 2017; US Department of Defense, 2017b). Finally, as information is the basic element used in decision-making the ability to manage information flow with sufficient speed to maintain the initiative is critical (Pilarski, 2017; US Department of Defense, 2017b).

Joint doctrine serves as the foundation for all doctrinal activities within the Department of Defense. However, joint doctrine is not written in a vacuum and flows vertically from strategic Presidential directives, which define the national security interests, and goals which can be found in the National Security Strategy US Department of Defense, 2017b). The United States Constitution, federal law, international law, and United States government policy govern the inputs to the National Security Strategy (NSS). Joint Publication 3.0 (JP 3.0) noted "The document outlines how the Department of Defense (DOD) will support NSS objectives and provide a framework for other DOD policy and planning guidance, such as the Guidance for Employment of the Force (GEF), Defense Planning Guidance, Global Force Management Guidance, and the Joint Strategic Capabilities Plan (JSCP)" (Executive Summary, p. X).

Joint Publication 3.0 serves as the keystone document for joint operational planning and is used to inform and scope individual service doctrine. For example, Joint Publication 3.0 serves

as the basis for the United States Army's Field Manual 3.0 *Operations*, the United States Army's Field Manual 5.0 *The Operations Process*, and the United States Marine Corps Marine Corps Warfighting Publication 3.0 *Operations*. By nesting service doctrine under joint doctrine, functional warfighting precepts are codified from the strategic to the tactical level. Figure 2-4 highlights the Common Operating Precepts.

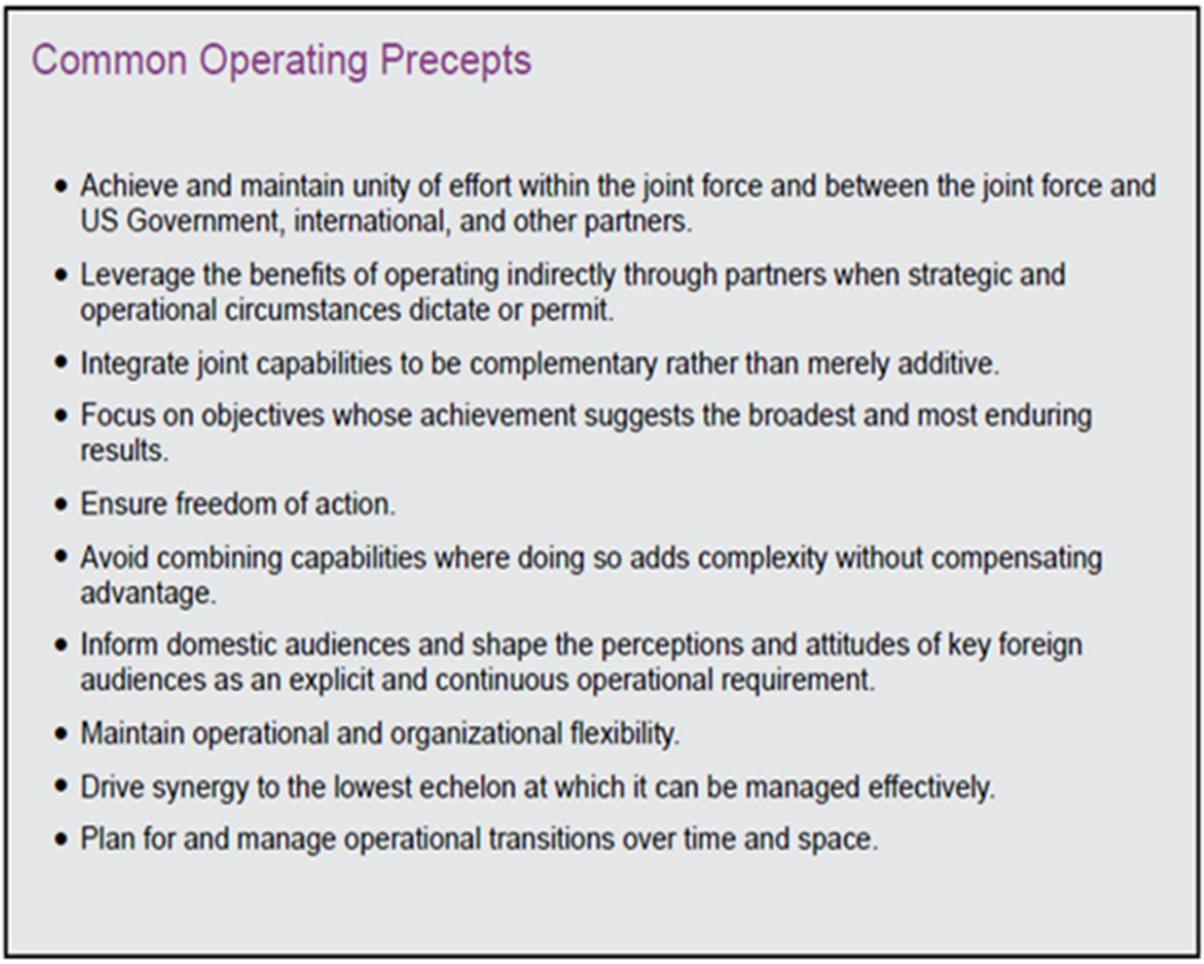


Figure 2-4 Common Operating Precepts for Joint Operations (JP 3.0, 2017; p. I-3)

Joint Publication 3.0 also provides guidance to Joint Force Commanders and their subordinates in order to plan, execute, and conduct measures of performance and measures of effectiveness. Both joint and service doctrine informs interagency, multinational and coalition

partners, Non-Governmental Agencies, and civilian leadership on the fundamental principles of warfare and common operating precepts (US Army FM 3.0, 2017; US Department of Defense, 2017b). Finally, joint and service doctrine detail the relationship between strategy and operational art used in the decision making process. Figure 2-5 depicts this relationship.

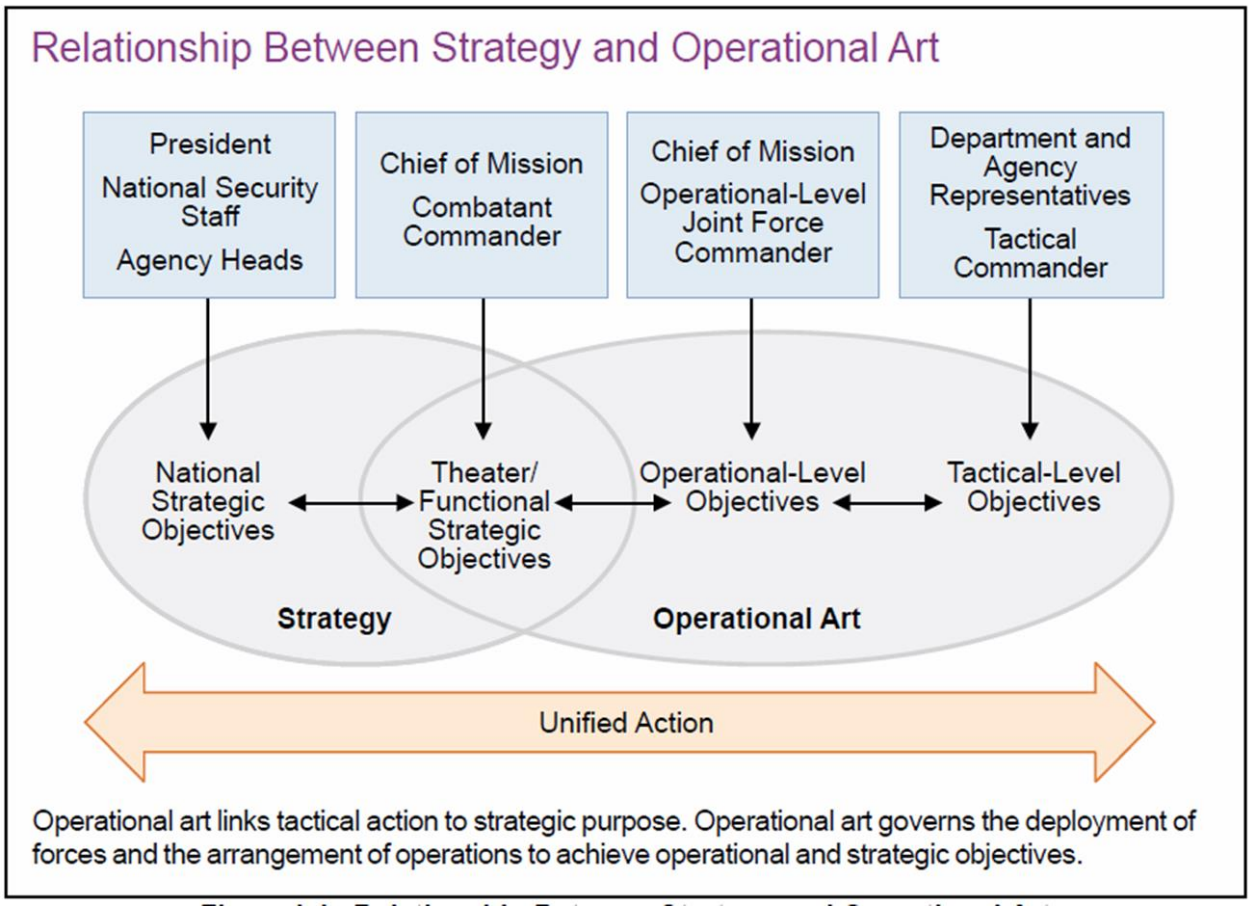


Figure 2-5. Relationship between Strategy and Operational Art (JP 3.0, 2017; p. I-13)

Within this doctrinal framework, the commander or subordinate leader retains the ultimate authority for decision-making. In this construct, the term command represents the lawful authority to exercise command over subordinates by virtue of rank or assignment. In concert with this authority is the responsibility to effective organize, direct, control, and coordinate military operations to accomplish designated missions. (US Department of Defense, 2017b).

Finally, commanders exercise command through the processes of mission command and commander's intent. Mission command utilizes decentralization of decision-making through mission-type orders. These orders allow subordinate leaders to exercise judgment and independent action to accomplish the mission while commander's intent provides the higher-level guidance on mission objectives and end states (US Department of Defense, 2017b).

However, decision-making at the commander level is not a straightforward and linear process. Complexities in the environment, uncertainty, organizational behavior, and service culture all conspire to reduce the efficacy of intuitive decision-making. Grigsby (2011) noted "…intuitive decision-making does not work well when the situation includes inexperienced commanders, complex, or unfamiliar situations" (p. 18). Moreover, how military organizations execute missions can be considered more an expression of culture than the function of the organizational doctrine (Teodor, Liviu, & Tiberius, 2018; Stephenson, 2016). Finally, Fraher & Grint (2018) posited what they term 'Agonistic Leadership' which is predicated on moving beyond a doctrinal approach to operational decision-making and accept that situational complexity generates paradoxes and contradictions thus reducing the efficacy of the doctrinal decision-making processes.

Culture and Organizational Behavior within the Department of Defense

Military organizational behavior and culture can be considered unique to most people. The training environment in Basic Training for enlisted personnel or Officer Candidate School for commissioned officers is designed to install the basic military cultural framework. This cultural framework includes the rituals, symbols and practices that provide meaning and common foundation for the military organization (Lanto Ningrayati et al., 2018; Stephenson, 2016). Furthermore, examining the culture and organizational behavior can provide unique

insights that may not be revealed during a functional analysis (Stephenson, 2016). Finally, culture and organizational behavior can negatively influence decision-making and impact to mission command (Fraher & Grint, 2018; Teodor et al., 2018).

Several attributes of the military culture serve as a counter-point to effective decision-making. First, the military culture tends toward risk aversion and can be less adaptable or innovative in learning from past mistakes (Fraher & Grint, 2018; Stephenson, 2016). Second, the current military culture focuses on technological superiority and numerical advantages that negatively influences mission command and operational flexibility (Lake, 2012). Third, culture and behavior are contextual and subject to outside influence over time. For example, the war in Viet Nam was a catalyst for cultural and operational change within the military as it sought to reconcile doctrine developed in World War II and Korea to an environment of asymmetrical warfare. Finally, differing cultural norms exists within the differing services thus positively and negatively influencing joint operations and decision-making at the strategic level (Fraher & Grint, 2018; Matthews, Reinerman-Jones, Burke, Teo, & Scribner, 2018; Stephenson, 2016).

Another important aspect for consideration is the military's focus on corporate business processes used to underpin the traditional command avenues. Post Viet Nam, the United States Army adopted private sector business practices as a means to ensure future success. This concept translated into a series of smaller and more focused officer assignments designed to foster career enhancing positions and knowledge. This process was followed by promotions that were based on individual merit, which resulted in an increased risk aversion and 'ticket-punching' assignments designed to move officers into positions of greater rank and responsibility (Stephenson, 2016). Finally, the United States Army's pursuit of technological advantage negatively impacted the Army's ability to train and develop officers that could embrace critical

thinking as well as intellectual pursuit of excellence (Stephenson, 2016). Consequently, decision-making at the command level does not necessarily follow the tenets of doctrine but instead may incorporate risk aversion, innovation failures, and a myopic outlook toward intellectual excellence.

The reliance on technological solutions to complex problems can be seen both in the joint and service specific environments. Lake (2012) noted an overreliance on technology which contributes to negative second and third order effects thus resulting in inefficient cost and supply models. More specifically, he examined structural engagement, decision dynamics, and a uniquely American way within the military of viewing problem solving and mission solutions through a purely tactical and technology framework. Additionally, Lake highlighted the growing trend in increased defense budgets but decreased tactical capability. While DOD has pursued technological superiority, there has been an associated reduction in combat force personnel structure. Consequently, there is less capacity for putting 'boots on the ground' from a power projection perspective which can negatively influence operational and strategic objectives.

Furthermore, Lake (2012) revealed two interesting cultural and behavioral models that influence military decision making. The first is the tendency within the military-industrial complex toward strategic materialism. In essence, strategic materialism is the focus on using technology and material goods to shape and influence conflict and warfighting. This results in a "…cultural bias toward technological solutions, which results in intensive use of cutting-edge technologies for maintaining qualitative superiority" (p. 74). Furthermore, increasing the technical complexity reinforces the requirement for additional support and technical personnel thus further reducing the combat force personnel allocations.

The second cultural factor is the continuing trend towards technology maximization. This pursuit then yields negative trends in decision superiority and warfighting capability by overlooking the human and cultural dynamic within the warfighting domain. Similar to the point noted above, the continued cultural emphasis on American casualty reduction through technology maximization allows near-state peers and non-state actors to focus efforts on defeating U.S. technology vice U.S. combat power. Finally, Lake noted "Therefore, as former secretary of defense Robert Gates notes, the United States may have reached the point of diminishing returns for focus on qualitative superiority" (p. 90).

Flournoy & Lyons III (2016) offer a similar view relative to IT acquisition and fielding. First the authors posit that DOD must pursue a clear vision for future IT acquisition and fielding. In order to further the development of a clear vision they note "Priority should be given to leaders with proven track records of innovative thinking, risk tolerance, and results" (p. 4). Additionally, the current bureaucratic methodology and tyranny of consensus within DOD must be corrected. The need for consensus reduces the solutions to the lowest common denominator while constraining efforts to develop innovative capabilities to solve complex problems. Finally, the authors noted the effect of inter-service rivalry on capability development in which internally developed service capabilities are championed at the expense of a holistic or joint solution set (Flournoy & Lyons III, 2016).

However, Flournoy & Lyons III (2016) contrast Lake in their examination of the positive effects of IT on mission accomplishment. Through innovative dialogue with the commercial technology sector, rapid advances in testing and fielding new IT products and services can be accomplished. Additionally, dialogue that encompasses the acquisition community may lead to more flexible authorities such as rapid acquisition, rapid prototyping, and other transaction

authorities. Flournoy & Lyons III noted “For the next NDAA [National Defense Authorization Act], the DOD and Congress should consider greater budget flexibility, as needed, for establishing programs faster than the two-year lead time driven by the program of record process” (p. 9).

Theoretical/Conceptual Framework

For any researcher, understanding theory and the theoretical frameworks associated with research projects is one of the most critical elements of the research process. Theory serves to explain relationships among phenomena while also providing a framework for research and analysis (Koh, 2013; Wacker, 1998). However, theory does not necessarily have a fixed meaning or definition. For some researchers, theory can be considered the glue that binds differing research problems within a given domain (Gelso, 2006; Harlow, 2010; Koh, 2013; Schmenner, Wassenhove, Ketokivi, Heyl, & Lusch, 2009). For others, theory provides generalizations across research disciplines but does not necessarily bound or limit the research under discussion (Lee, 2014; Stam, 2000; Stam, 2010). Finally, theory can be considered the codification of thought and action thus providing the foundation for practical applications while guiding research toward understandable constructs (Barratt, Choi, & Li, 2011; Lidén, 2013; Wacker, 1998). Much like Schrödinger's cat (Bogdan, 2016), theory can be considered a duality in which it is both intellectual and practical depending on the viewpoint of the researcher and the research problem.

However, arguments have been made within the academic community that theory is not required for research. Within this paradigm, observations in the real world serve as the basis for research and the researcher starts with generalized questions which are then used to form testable hypotheses (Cucina, Hayes, Walmsley, & Martin, 2014). In this model, theory is not introduced throughout any stages of research. Although this framework may seem intuitive and cast doubt

on the use of theory that is not the case. Use of this model may result in conclusions based on the scientific method but the lack of theory allows for unfocused research and results in disparate data sets and conclusions that lack a coherent totality (Ashkanasy, 2016; Whetten, 1989)

Relationship between Theory and Application

The relationship between theory and practical application is iterative in nature and should create a feedback loop that both informs practical application external to academia and provide additional problems sets that can be considered for academic research. Here theory serves as the foundational framework that establishes the limits of the research while serving to unify the abstract and the concrete (Barratt et al., 2011; Schmenner et al., 2009). Consequently, theory sets the stage for research experimentation and allows for follow-on applications external to academic research (Ashkanasy, 2016; Gelso, 2006).

Theory can be used to contribute to practical application in several ways. First, research experimentation and practical application support consequent theory development and refinement thus integrating the abstract and concrete elements of theory and application (Lidén, 2013). Additionally, the use of research conclusions by a non-academic organizations serve to provide further validation or refutation of the conclusions thus leading to further questions and hypotheses for additional research. Through this iterative process, theory informs the research application and the practical application informs further refinement of theory. For example, Einstein's General Theory of Relativity (GTR) had been applied as an overarching theory for astrophysics. However, the GTR breaks down when conducting research and application at the atomic level thereby limiting the generality of GTR (Singh, 2016). Consequently, previous research validated GTR at the macro and meso level but invalidated GTR at the micro level

thereby opening the door for further practical application challenges and validation for quantum level research (Singh, 2016).

Second, theory informs and expands the opportunity for research and practical application in current or tangential disciplines. Through the iterative process noted earlier, research and practical application serve to identify gaps in the body of knowledge or hindrances that may be found when applying research to real world problems. This process then creates a positive feedback loop that contributes to future theoretical development and refinement (Ellis & Levy; 2008; Lidén, 2013). One example can be found in the use of Grounded Theory (GT) within qualitative studies. GT can be used as a means to conceptualize sociological and behavioral research problems coupled with fully capturing the richness of the phenomena under discussion (Suddaby, 2006). Additionally, GT transcends the integration of people, time, and space thus allowing for a rich description of the linkages associated with disparate data sets that may otherwise be overlooked in other theoretical frameworks (Glaser, 2002). Lastly, GT may serve to transition theory to practical application by establishing real world examples of where GT validated the research problem thus allowing for further use within external environments (Glaser, 2002).

Third, theories serve to form an integrative functionality between the underpinning theoretical framework and the practical application be it either research or real world use. In other words, theory must holistically integrate previous constructs and propositions thus allowing the researcher or practitioner to understand the limits of the conclusions and aid in determining potential real world applications (Gelso, 2006; Harlow, 2010). Similar to building a house, theory provides the framework and the research or practical application can be viewed as the

walls and roof thereby enabling a holistic view and moving beyond a random collection of facts and data points (Gelso, 2006; Koh, 2013).

However, some problems do exist translating theory into practical application. The example noted earlier relative to GTR highlights the challenges with developing an overarching theoretical framework for astrophysics given the complexities of the phenomena. Additionally, quantitative and qualitative methods of inquiry may yield differing results to similar research problems thus highlighting the challenges in the use of theory as a framework for research development and execution (Ashkanasy, 2016; Ellis & Levi, 2008; Stam, 2000). For example, a researcher could use a quantitative approach to IT governance and IT systems adoption using Technology Acceptance Models (TAM) as the theoretical framework and determine a measure of causality between ITG and adoption of new IT products. Unfortunately, a different researcher could use TAM as a theoretical framework in a qualitative study focused on the mediating factors between technology adoption and determine alternative conclusions based on a similar set of factors and variables (Korpelainen & Kira, 2013).

In many cases theory can only be used to explain a part of the phenomena and not the whole (Lee, 2014). Within the ITG domain, TAM or Principal Agent Theory can be used as the framework for research and practical application; however, IT can be considered a system of systems whereby interactions between one set of variables have ripple effects over other variables that may not be part of the original research problem (Lee, 2014; Tonelli et al., 2017; Wacker, 1998). Consequently, theory may not encompass the totality of the problem under research thus limiting overall study generality (Krathwohl, 2009).

Phenomenology

A phenomenological study focuses on the shared experiences within a common group. For the researcher, using a phenomenological approach allows for a broader understanding of the phenomenon in question by exploring the dynamics of the group experience and how each member of the group understands the phenomenon under review. Here Cresswell (2013) quoted Van Manen (1991) that phenomenological research provides "…a grasp of the very nature of the thing" (p. 177). Furthermore, Cresswell (2013) noted Moustakas (1994) in that phenomenological research provides a description of what the individual experienced and how they experienced the phenomenon. Finally, the researcher must be able to see the phenomenon through the eyes of the participants in order to fully understand the symbolic interaction between the participant and the phenomenon (Krathwohl, 2009).

For this study, a transcendental phenomenological approach was used. Within this construct, the researcher is more focused on descriptions of the experience by the participants as opposed to the hermeneutics phenomenology processes in which the experiences of the researcher are more prevalent (Cresswell, 2013, Yin 2016). Here the researcher will bracket out their internal views of the experience before researching and coding the participant's experiences (Cresswell, 2013; Moustakas, 1994). Finally, the researcher analyzes and reduces the collected data to significant statements for thematic coding into textual and structural descriptions (Cresswell, 2013).

However, there are challenges that must be addressed when conducting phenomenological research. First, the participants must be carefully chosen to ensure that all have experienced the phenomenon and that naturally leads to a common understanding by the researcher (Cresswell, 2013) Second, care must be taken by the researcher when bracketing his experiences from the experiences of the participants to ensure internal and external validity.

Finally, phenomenological research requires a basic understanding of the broader philosophical assumptions under which the study is taken (Cresswell, 2013).

Theoretical Frameworks and Information Technology Governance Research

Functionalism arose in the social sciences in which there are few instances where theory can be expressed in mathematical terms. As the social sciences entail human interaction among multiple settings and environments, it can be problematic to reduce hypotheses and research testing to a statistical and empirical means (Stam, 2010). This is not to say that empirical aspects do not exist in the social or behavioral sciences, but that interactions among participants cannot be readily converted into mathematical equations (Stam, 2010; Wacker, 1998). Consequently, functionalism has remained the dominant form for research within the social sciences (Stam, 2010).

As functionalism relates to the social and behavioral sciences, it may be considered one the more appropriate viewpoints of theory when discussing information technology use and governance within the public sector. Although there is limited research within the public sector, and more specifically the Department of Defense (DOD), there are several studies that can provide context to the research problem with regard to the application and efficacy of information technology governance (Min-Seok et al., 2014; Whitehead et al., 2011). Furthermore, capturing the efficacy of information technology (IT) investment or the relative benefits of IT's incorporation can become problematic for many organizations or business units (Barua et al., 2010; Obeidat & North, 2014; Petter et al., 2012). Several factors can contribute to the quandary including how to effectively measure IT gains, IT's cumulative impact on business operations from a cost of ownership perspective, and measuring how IT influences traditional and non-traditional business decisions. ITG can become even more problematic when

transitioning from the private to public sector as the variables take on differing meanings and impacts (Chun et al., 2011; Coleman & Perry, 2011). Consequently, functionalism represents the best theoretical viewpoint for public sector ITG research.

Notwithstanding the concerns noted above, there are several theoretical frameworks worthy of consideration including Stakeholder Theory (STH), Grounded Theory, Principal Agent Theory, Social Network Theory, Implementation Theory, and Institutional Theory. The aforementioned theoretical frameworks have been used extensively within the ITG field and consistently serve to bound and define the intended research parameters (Majchrzak, Markus, & Waerham, 2016). STH posits the general concept that all members of an organization (stakeholders) have a vested interest in the utility and efficacy of artifacts or organizational processes (Devos & Van de Ginste, 2015). Second, STH provides the underlying structure for balancing competing demands of an organizations various stakeholders (Chan, Watson, & Woodliff, 2014). And, finally, STH promotes treating all stakeholders with courtesy, respect, and fairness in organizational decision making processes. As IT, and more specifically, ITG is the fusion of business strategic goals and the application of IT to meet said goals, the employment of STH provides a solid foundation for ITG research.

Application of Stakeholder Theory Relative to Information Technology Governance

Within the context of ITG, STH provides a theoretical framework relative to organizational actors, both internal and external to subordinate units, while incorporating the variables of strategic alignment, IT maturity models, and resource allocation. The use of STH also allows the researcher to focus on three principal questions: 1) who are the stakeholders; 2) what do stakeholders want; and 3) how do stakeholders influence ITG (Devos & Van de Ginste, 2015). Additionally, STH allow the researcher to investigate primary constructs, organizational

relationships, scope of ITG efficacy, and causal or approximate correlations (Devos & Van de Ginste, 2015).

As noted earlier, strategic alignment is one of the key elements of effective ITG (Ahmad et al., 2013; Balocco et al., 2013; Goosen & Rudman, 2013; Min-Seok et al., 2014; Whitehead et al., 2011). However, public sector examination of IT strategic alignment has not kept pace with studies within the private sector (Amali et al., 2014; Nfuka & Rusu, 2013; Tonelli et al., 2017; Whitehead et al., 2011; Wilkin & Chenhall, 2010). Consequently, the relationship differential between private sector stakeholders and public sectors stakeholders has not been fully explored (Al-Farsi & El Haddadeh, 2015; Amali et al., 2014; Nfuka & Rusu, 2013; Tonelli, et al., 2017). Furthermore, strategic alignment must be viewed contextually and through the lens of both strategic business decisions coupled with IT requirements and associated technical capacity thus meeting the theoretical framework for STH (Ahmad et al., 2013; Balocco et al., 2013; Goosen & Rudman, 2013; Min-Seok et al., 2014; Tonelli et al., 2017).

Further compounding this problem are the cultural and behavioral aspects relative to public sector decision making within the ITG domain. The differing military services educate and train to service-specific standards that can show considerable differences in understanding and addressing ITG. This then sets the stage for competing philosophies among the principal stakeholder groups and can result in conflicts between legislatively directed processes for ITG and operational or strategic requirements to meet emerging geo-political events under the purview of the Geographic Combatant Commands.

Stakeholder Theory and Controversy vis-à-vis Information Technology Governance

However, there are areas of controversy and unanswered questions concerning the use of STH for public sector ITG research. First, cultural and behavioral factors must be addressed with

regard to resource allocation and the relationship between ITG and the maximization of organizational resources. Here, ITG nominally serves the functional role relative to decision rights allocation and the fusion of IT with business objectives. This role then underpins the relationship wherein ITG can serve to maximize resources while reducing cost throughout the enterprise (Ahmad et al., 2013; Balocco et al., 2013; Debrency, 2013; Goosen & Rudman, 2013; Héroux & Fortin, 2013; Min-Seok et al., 2014; Whitehead et al., 2011). However, it can be difficult to qualify the effects of ITG on resource allocation given the competing calculus used to establish measure of effectiveness within the public sector (Al-Farsi & El Haddadeh, 2015; Amali et al., 2014; Drnevich, & Croson, 2013; Min-Seok et al., 2014). Given this difficulty, return on investment and total cost of ownership calculations become problematic in determining the relationship between performance and ITG thus inhibiting the STH theoretical framework.

Second, the situation noted above can easily become more complex when factored into the decision making process with the DOD. Here changing geopolitical dynamics and low probability/high impact events must be included in any resource allocation decision and very few studies have explored this dynamic (Flournoy & Lyons III, 2016; Guttieri, 2014; Héroux & Fortin, 2013; Lake, 2012). Consequently, there are several unanswered questions relative to employing STH for DOD ITG research. For example, how do stakeholders within differing organizational constructs compete for resources or influence resource allocation outside normative ITG channels (Min-Seok et al., 2014) to meet those low probability/high impact events?

Nonetheless, STH remains a viable theoretical construct for the research study. STH supports exploring the interplay of culture and behavior on differing organizational groups within the ITG domain. Additionally, STH allows for examining the differing stakeholders

throughout internal and external organizational constructs and their influence on ITG efficacy. Finally, STH provides the framework for identification and exploration of causal or proximate correlations among the stakeholder groups (Devos & Van de Ginste, 2015).

Alternative Theoretical Framework Considerations

GT has been used primarily within the social sciences as a theoretical framework suited for qualitative analysis by allowing for conceptualization of the data and focusing on the interpretive process by analyzing the contextual meanings and concepts used by participants in social science research settings (Suddaby, 2006). Furthermore, GT allows for diverse analyses of the research problem through pattern identification analysis (Glaser, 2002; Hussein, Hirst, Salyers, & Osuji, 2014). Finally, GT allows for a systematic approach to data analysis and fosters the depth and richness of the narrative and research conclusions (Hussein, Hirst, Salyers, & Osuji, 2014).

GT is an inductive research process that provides the framework for the researcher to validate their current findings while simultaneously developing recommendations for future research (Glaser, 2002). GT also provides a bridge between inductive and deductive research by allowing researchers to develop new theories that can be extended to a classical deductive approach to research and analysis (Murphy, Klotz, & Kreiner, 2017). Additionally, GT provides an intuitive appeal toward research execution and conclusions. As GT is not limited to a specific research discipline or field, GT informs a diverse range of studies and wide range of applications (Hussein et al., 2014). Consequently, GT provides the novice or experienced researcher a grounded set of principles and GT shows extreme suitability toward answering research questions, framing the research process, and providing concrete approaches to data analysis (Dillon & Taylor, 2015; Glaser, 2002; Hussein et al., 2014).

GT maintains a strong showing among researchers in the IT field and allows the researcher to develop a model that simultaneously grounds qualitative research in empirical observations and fosters data analysis (Wiesche, Jurisch, Yetton, & Krcmar, 2017). Numerous studies have been conducted using GT as the theoretical framework thus highlighting the utility of GT within the IT research discipline (Dillon & Taylor, 2015; Rich, 2012; Wiesche et al., 2017). Additionally, GT has generated significant momentum within the operational and human resource management discipline due the focus on inductive processes and the ability to address the complexities of human interaction within differing environmental settings (Barratt et al., 2011; Murphy et al., 2017).

However, both IT and human management researchers have been challenged in their use of GT. In the case of IT, there is some ambiguity relative to GT application within the IT research domain coupled with the use of GT, not as a means to develop new theory, but merely to extend rich descriptions of a current phenomenon (Wiesche et al., 2017). From the human resources perspective, the unfamiliarity of GT as opposed to classical deductive processes serves to hinder GT use in research (Murphy et al., 2017). Additionally, GT may be viewed with skepticism by human resources researchers similar in the way that qualitative research was viewed with skepticism during the positivism and empiricism age (Ahmed & Haag, 2016; Barratt et al., 2011; Murphy et al., 2017).

Summary

There are two conclusions that can be drawn through an analysis of the literature and previous studies on ITG. The first is the continued correlation between strategic alignment and ITG; however, this correlation must be tempered with difficulty in determining actual organizational performance gains. One must also note that traditional performance calculations

may not apply thus necessitating a new calculus for return on investment and total cost of ownership as employed under private sector conditions. Nor can one discount the magnitude of research focused on private sector operations vice public sector performance and the analysis shows that additional effort must be spent in developing categories of public sector performance that can be measured empirically and qualitatively (Min-Seok, et al., 2014; Schobel & Denford, 2013).

The second conclusion is the contradictory nature relative to the ITG and previous scholarly literature and studies. For example, there is contradictory evidence for the relative value of ITG toward resource allocation and whether mediating or confounding variables contribute to organizational success (Al-Farsi & El Haddadeh, 2015; Nicho & Muamaar, 2016). This can be attributed, in part, to the complex nature of socio-economic behaviors in regard to ITG. Whereas traditional business calculus can be used to determine the efficacy of labor and capital decisions, the unique and ubiquitous nature of IT serves to dilute the calculation efficacy while increasing the value of qualitative vice empirical analysis. Consequently, additional studies must be conducted focusing on the linkages between resource allocation and ITG within the public sector.

The use of qualitative vice quantitative methodologies might at first seem counterintuitive given the technical and quantitative nature of IT. However, as the phenomena to be studied focuses on cultural and behavioral mores within DOD decision makers, the use of qualitative research better addressed the problem statement and research questions. In this fashion, the research puts “the meat on statistical bones” (Krathwohl, 2009; p. 237) and moves beyond simple correlation or causality.

As with many studies involving IT and ITG, the use of a qualitative methodology is less prevalent. However, the studies noted in the literature review show the efficacy of addressing ITG through a methodology that focuses on more than statistical analysis and encompasses the cultural, behavioral, and sociological implications resident in ITG. As the interplay of culture and behavior relative to ITG encompasses more than the end-user devices or underlying IT topology, the individual and group perspective on IT implementation and resourcing can easily be influenced by cultural and behavioral patterns resident in the user and decision maker groups.

Finally, the phenomenological study framework allows the research to explore areas outside simple statistical analysis. The interplay of culture and behavior relative to ITG and Clinger-Cohen efficacy encompasses more than the mere technical artifact and the individual and group perspective on IT and IS resourcing can easily be influenced by joint and service-specific cultural and behavioral patterns. The methodology also provides the opportunity to explore group network and social structures through systems interaction using Stakeholder Theory as the foundational framework.

Chapter 3: Research Method

The research problem is found in the dichotomy between employment and execution of private sector information technology (IT) governance (ITG) practices and the furthering contrast within the Department of Defense (DOD) relative to the operations community and the IT community. On one hand is the requirement to provide for the nation's defense and achieve mission success through strategic objectives and alignment with national policy (US Department of Defense, 2017a). On the other hand, is the requirement to be fiscally responsible for acquisitions and procurement (Eiband et al., 2013; McGrath, 2011; Page & State, 2012) relative to IT (Min-Seok et al., 2014; Nfuka & Rusu, 2013; Whitehead et al., 2011).

Compounding this environment is the reality that DOD mission areas tend toward low probability mission sets with high societal/geopolitical impact. These conditions necessitate acquisition and procurement of IT systems that rely heavily on capacity, confidentiality, integrity, availability, and redundancy. Consequently, a state of competing strategic and operational goals can be seen in which the operations community focuses on mission success independently of costs while the IT community focuses on ITG based on private sector models which use a differing calculus for relational attributes between risk management and IT standardization (Amali et al., 2014; Dawson et al., 2016; Debreceny, 2013; Page & State, 2012; Tonelli et al., 2017; Whitehead et al., 2011).

The purpose of this qualitative study examined the ITG phenomenon internal to the Geographic Combatant Commands' decision-making processes and explored the cultural and behavioral frameworks relative to their influence on ITG and CCA efficacy requirements. A phenomenological approach was used to determine the extent that behavioral and cultural processes resident in the military operational community affect, counter to statutory regulation,

the subordination of ITG processes. Data was collected through purposive sampling and semi-structured interviews with members of the Association of the United States Army (AUSA), the Armed Forces Communications and Electronics Association (AFCEA), the Signal Corps Regimental Association (SCRA), and LinkedIn. Finally, secondary data sources were used to further refine data coding and themes and serve as a means for data triangulation.

The first section of the chapter is focused on the research methodology and design followed by population and research sample. Successive sections detail study materials, instrumentation, procedures, and data collection methodology and analysis. Finally, delineation of ethical processes employed by the researcher are described.

Research Methodology and Design

On the surface, the study of IT or information systems (IS) would appear technically based and, therefore, a quantitative methodology would be preferred. Research on correlation and causality among independent and dependent variables comprise one aspect of the quantitative method; however, IT and IS are only the technological artifacts and human behavior, coupled with culture, influence how and in what fashion IT and IS will be employed (Brown, 2014; Wynn & Williams, 2012). Within this paradigm, a qualitative methodology would be best suited within the underlying framework of phenomenology as a qualitative methodology is used to explore, discuss, and understand a central phenomenon (Cresswell, 2013; Krathwohl, 2009; Yin, 2003). Through the use of broad and general questions, the researcher can collect detailed and instructive views from the participants via statements, images, and impressions which form the basis for analysis of the context and themes (Cresswell, 2013; Dane, 2011; Krathwohl, 2009). By focusing on the interplay of cultural and behavioral factors, a practical business application can be developed to qualify patterns and impacts on ITG efficacy within Geographic Combatant

Commands thus facilitating the decision making process and improve both maturity models and resource allocation.

A qualitative research design was appropriate for the research study as the focus was on exploring the cultural and socio-behavioral mores and attitudes of operations and IT professionals within the Geographic Combatant Commands. In contrast, quantitative analysis is statistically oriented focused on determining correlation or causal variables that influence and shape future outcomes (Krathwohl, 2009). Consequently, a qualitative approach more fully allowed the researcher to explore the phenomenon and to fully detail the context and factorial interplay of social dynamics in a natural setting (Cresswell, 2013; Dane, 2011).

By using phenomenology, the researcher explored the dynamics of culture (implicit and explicit within the participant group), behavior, and the interplay of multiple forces that operate in differing modes depending on the phenomenon at hand. For example, normative ITG is related to strategic goals and objectives thus nesting resource allocation for IT and IS within a traditional outlook (Debreceny, 2013). Within the public sector, and more specifically DOD, this normative role may or may not be followed given the exigencies of external forces (Min-Seok, et al., 2014; Whitehead, et al. 2011). These external forces can be geopolitical or social in nature and the relationships established relative to the participant pool influence the decision making process. Consequently, the use of a qualitative approach was better served for examining the interplay among various cultural and behavioral roles vice attempting to quantify cultural and behavioral independent and dependent variables in a correlative or causality design (Cresswell, 2013; Dane, 2011). Additionally, the cultural and behavioral attitudes serve to construct prioritization frameworks within the two communities. These prioritization frameworks identify means to utilize resources in differing ways and relate directly to how culture and behavior shape ITG.

A differing qualitative method, namely Grounded Theory (GT), was considered for this research study. GT originated with Glaser and Strauss and could be considered appropriate for IT and IS research (Venkatesh, Brown, & Bala, 2013). Furthermore, both Creswell (2013) and Dane (2011) noted that GT can be considered a systematic and qualitative procedure that allows researches the capability to generate a theory which provides an explanation for a process or interaction relative to the research topic. However, the current research study was exploratory in nature and was not focused on developing a theory. Consequently, GT was not be appropriate for this research problem (Hussein, Hirst, Salyers & Osuji, 2014; Suddaby, 2006).

Semi-structured interviews conducted face-to-face or telephonically, based on the protocols concurrent through the research domain (Marshall & Rossman, 2006; Seidman, 2006), were employed for structured data collection. Data collected through the interviews was used to assist in further exploring the situation and how the individual perceives the Clinger-Cohen and ITG variables along with providing clues and process mechanisms resultant from the ITG processes and procedures (Baxter, & Jack, 2008; Creswell, 2013; Krathwohl, 2009). Finally, secondary data sources including the federal government's IT Dashboard and the Program Assessment Rating Tool (PART) were used for data triangulation.

Semi-structured interviews with selected IT and operational personnel were used to capture both the critical aspects of ITG and decision making process along with the interplay of factors relative to individual and group behavioral dynamics. Within the interviews, the differing factors that are discussed and the subsequent rationales for determining ITG and resource allocation were explored. Additionally, the effect of operational priorities and how that influences ITG was captured.

Population and Sample

The population were officers and governmental civilians who are members of the Association of the United States Army (AUSA), the Armed Forces Communications and Electronics Association (AFCEA), the Signal Corps Regimental Association (SCRA), and LinkedIn all of whom have been or were still employed within the DOD. The total number of DOD members is 3.5 million including active duty personnel, reserves, and National Guard forces. Within this total, males comprise 84.9% of the force and females comprise 15.1 %. 49.5% are less than 25 years of age with the next largest age demographic being 26-30 years (22.1%). Of significance to the research study are those between the age of 36-50 years (34.8%). As the study focused on ITG and decision making, the age of many in the participant pool fell within this range. Of the total population, 16.9% are officers and government civilians comprise 24.1% (US DOD, 2017).

Given the intention of the study, this population provided adequate suitability. One element of the research study examined the cultural and behavioral patterns relative to ITG. The population was well grounded in IT integration and the operational art. The population of officers and governmental civilians provided the right mix of differing backgrounds and education thus serving to generalize of the study conclusions. Additionally, the population traditionally operates under written guidance and directives that were used to augment data veracity and perceptions.

The participant pool was comprised of purposive sampled officers and governmental civilians whom are members of the AUSA, AFCEA, SCRA, and LinkedIn. The sampled individuals had experience within the Operations Directorate (J/3) and the Command, Control, Communications, and Computers (C4/IT) Directorate (J/6) within a Geographic Combatant

Command (GCC). Participants selected from the Operations community were primarily combat arms officers and were be graduates of their respective service Command and Staff officer programs. Participants selected from the IT community were also be graduates of their respective service Command and Staff programs along with applicable training in IT practices and procedures. Governmental civilians from both communities were former or retired military officers or enlisted with commensurate education and training to be comparable to the military officer pool. Sampling was purposive and the number of participants was 20. The intended pool was comprised of at least 40% government civilians and at least 40 % military officers.

As the purpose of the research study was to determine cultural and socio-behavioral influences relative to ITG and Clinger-Cohen efficacy, a purposive sample of at least 20 operations and IT professionals allowed for exploring the phenomenon through semi-structured interviews and was focused on obtaining a specific element within the research problem construct (Dane, 2011). Unlike random sampling frameworks used in quantitative analysis, qualitative analysis is focused on exploring the breadth and depth of the participants thus providing a richer narrative and more open-ended approach than can be found in statistical analysis (Cresswell, 2013; Dane, 2011; Marshall & Rossman, 2006).

Finally, qualitative methodology is designed around smaller sample sizes than would normally be found in a quantitative methodology (Cresswell, 2013; Krathwohl, 2009). For the purpose of this phenomenological study, the sample size was deliberately small as the research was focused on obtaining and analyzing the participant's perception and attitudes of the phenomenon. Furthermore, purposive sampling and snowball sampling were more appropriate for selecting participants whom possess intimate knowledge and understanding of the phenomenon (Cresswell, 2013; Dane, 2011).

Participants were selected based association within professional and fraternal organizations such as the Association of the United States Army (AUSA), the Armed Forces Communications and Electronics Association (AFCEA), the Signal Corps Regimental Association (SCRA), and LinkedIn. Finally, secondary data sources were used to augment the interviews and assist contextual data coding and themes.

Materials/Instrumentation

The research study incorporated a qualitative phenomenological research design employing elements of Moustakas' modifications of the Van Kaam methodology for phenomenological data analysis (Moustakas, 1994). Consequently, interviews were the primary method for data collection. The instrument used for the research study were semi-structured face-to-face and telephonically conducted interviews.

For the research study, the interview tool was adapted from previous research on ITG and CCA efficacy. As this instrument was new, beta testing of the instrument was conducted with a separate group of participants. The beta testing participants were not incorporated into the study parameters or final sample (Cresswell, 2013). The secondary data collection instruments were Congressional testimony, the United States government IT Dashboard, and Program Assessment Rating Tool (PART) Exhibit 53. The secondary sources were used to augment the primary instrumentation tool.

Data Collection and Analysis

Before data was collected, permission was obtained from the Institutional Review Board of Northcentral University. A Call for Participants Letter was posted to the websites of the aforementioned fraternal organizations. Participants that accepted study recruitment were provided an acceptance letter which contained parameters of the study and informed consent

approval. As the interviews were taped for subsequent transcription, an additional waiver was included noting the transcription, storage, and destruction process.

For this study, there were two forms of data collection. The first method was through semi-structured interviews. During this phase, the researcher used purposive sampling to identify, obtain informed consent to interview, and schedule face-to-face or telephonic interviews. The second form of data collection was the use of secondary sources such as Congressional testimony, the United States government IT Dashboard, and Program Assessment Rating Tool (PART) Exhibit 53. The use of secondary data sources was used to triangulate interview coding, provide context, and ground study validity. Additionally, care was taken not to allow reflexivity compromises or cognitive biases to influence the researcher throughout the interview process. (Brown, 2014; Krathwohl, 2009).

The first method was through the interviews. The interviews were semi-structured and proceed from the macro to the micro. Interview content included experiences, opinions, knowledge of both operational art and ITG, and background demographics were used to augment and enhance survey demographics (Krathwohl, 2009). Face-to-face and telephonically conducted interviews were the primary interview medium with Skype serving as the secondary medium. Interviews generally lasted from 35-45 minutes and notes were taken during the interview process. Interviews were audiotaped and transcribed to enhance validity of the sessions and support data coding (Rosenthal, 2016).

Ethical considerations were addressed through subject coding that did not contain any identifiable information and use of consent forms. As the researcher is a peer to many of the participant pool ranks (military) and grades (civilians), there were no compensational or explicit/implicit privilege or entitlement inducements for participation in the research study.

Within this data collection process there were both advantages and disadvantages. The primary advantage was the ability to explore in-depth any cultural or behavioral attitudes or perceptions toward mission accomplishment and the interrelationship to ITG. As this is the foundational purpose for the study, the opportunity was maximized to attain clear and concise results. Finally, the one-on-one interview approach moderated group dynamics thus providing a clearer picture of the environment and underlying phenomenon (Krathwohl, 2009; Venkatesh, Brown, & Bala., 2013).

The primary disadvantage was the potential for reflexivity compromises due to the close nature of the study and the researcher. This disadvantage was mitigated through extensive note-taking and transcription during the interview process. The second disadvantage was the potential for elite bias. As many military officers and governmental civilians are highly educated and very articulate, there existed a potential for weighting of the data toward more articulate participants or senior officers. As with reflexivity, extensive notes and transcripts coupled with independent data coding was employed to mitigate the potential for elite bias. Finally, purposive sampling could have introduced additional bias as the sample focused on participants with experiences and background at Geographic Combatant Commands. However, this disadvantage was mitigated through the selection of fraternal organizations members with the widest array of experience at differing Geographic Combatant Commands.

Coding was used to identify key concepts and themes relative to the research. There are several methods that could be successfully employed and the researcher used a variation of Bogdan and Biklen. The initial coding categories included: context codes (description of setting and participants), situation codes (interaction between participants relative to setting and study topics), key word repetition, words used in context, participant perspectives toward operational

focus and ITG use and efficacy, and relationship and social structure codes. As the coding process developed and more insight into the research data was attained, it was necessary to check the consistency of data relative to the initial coding and further refinement of coding analysis was conducted.

The next coding step was the development and testing of generalizations. Current generalization was that the operational community is more concerned with mission accomplishment than resource allocation. Consequently, ITG could suffer as IT systems and applications are fielded that may not meet operational requirements or squander limited financial resources for little gain in mission effectiveness. Another area for initial consideration was the use of graphics to help explain relationships resident in coded data. This would be similar in nature to a process map that identifies inputs/outputs and relationships between disparate variables. Finally, the coding was compared to other qualitative research in the IT and IS field and which was then used to strengthen the research conclusions.

Research quality and rigor were maintained by focusing on the three major types of validity and reliability. Internal validity was enhanced through the use of pattern analysis and environmental, context, and situation coding. Construct validity was maintained through data collection and analytics software (QSR International's NVivo 12) and transcripts of the interviews. Additionally, the secondary sources served as a means of triangulation thereby assuring credibility and dependability. External validity was maintained through extensive literature reviews and cross-referencing the research study with other academic or institutional documentation. Finally, reliability was aided by rigorous application of documentation standards and accountability. This also served to provide the audit trail necessary to be considered credible by all parties.

Assumptions

The purpose of the research study was to determine the mediating influence of culture and behavior on Clinger-Cohen Act efficacy within the Geographic Combatant Commands. Within this study framework, several assumptions were made including:

1) The sample selected from the differing Geographic Combatant Commands were adequate to answer the research questions.
2) Research participants honestly described their experiences relative to ITG during the interview process. Additionally, participants possessed the requisite experience to provide descriptive details for the phenomenon under research.
3) The researcher was able to identify and interview 20 participants with the range and experience required to facilitate the study.
4) That security classification approvals were received.

Limitations

The primary limitation entails the geographic separation between study participants. As the research explored participants at differing levels of their respective careers, participants were not all within the same geographic location as the researcher. Additional limitations include:

1) Data obtained from the participants may not be quantified or triangulated through secondary sources.
2) There is limited research on the mediating influence of culture and behavior on Clinger-Cohen Act efficacy.
3) Participants may not be entirely truthful as a means to obscure lack of Clinger-Cohen Act compliance or to mitigate the effect of the operational community priorities.

Delimitations

The study was conducted using a limited range of personnel with first-hand experience at Geographic Combatant Commands. As these personnel tend to be senior in age and rank, there were inherent restrictions on study participants. Finally, the study focused on the IT and Operations community and did not include participants from other directorates within the Geographic Combatant Commands.

Ethical Assurances

For the researcher, ethical issues and determinations are present in any kind of research and the research process can create dichotomies between the desire to fully research a particular problem area while maintaining an ethical bearing with regard to beneficence, justice, and informed consent. Unfortunately, adherence to ethical principles has not been consistent over time and several examples such as the Nazi experiments on humans during World War II, the Tuskegee syphilis study, and the thalidomide prescription and use in pregnant women (Koski, 2010; Rice, 2008) have been seen. Consequently, ethical codes for human research were codified in the Nuremberg Code of 1946, National Research Act of 1974, the Belmont Report in 1978, and 45 Code of Federal Regulations (CFR) 46 (APA, 2016; Rice, 2008). Although other formalized codes such as the Code of Berlin of 1900 and the Germany Regulation on New Therapy and Experimentation, existed before the ones noted above, the principal ethical conduct requirements which scope and limit research on human subjects are contained in these foundational doctrines.

Risk assessment

Evaluation of risk is integral to every facet of research involving human subjects (Hey & Kimmelman; 2016). Although the IRB serves a principal role in the final determination of risk

assessment and risk benefit analysis relative to proposed research projects, the individual researcher bears of measure or responsibility to ensure that federal regulations and appropriate guidelines are closely followed. Additionally, many researchers tend to underestimate risk while formal vetting organizations such as the IRB tend to overestimate risk (Hey & Kimmelman; 2016). Furthermore, analysis of risk versus benefits can be subjective in nature thus lacking a clear objective means to appropriately assess risk (Hey & Kimmelman; 2016).

For the research study, minimal risk was involved. A normative definition of minimal risk involves determining whether any discomfort involved during the testing or research process would be greater than those that may be experienced in a normal daily routine (Koepsell, Brinkman, & Pont, 2015). This definition is also in keeping with 45 CFR 46 and this qualitative study used interview questions that are not of a personal nature but that address the dichotomy between the Clinger-Cohen Act and the operational requirements to meet mission sets for the Geographic Combatant Command.

Physical risk to study participants was mitigated through the use of telephonically conducted interviews. For in-person interviews, areas were used that were user and ergonomic friendly, pathways to seating areas were clear of any obstructions, and water was provided to participants in a no-cost arrangement. Psychological factors were mitigated by using telephonically conducted interviews and, where applicable, arranging the interviews in spaces where other Geographic Combatant Command personnel are not present thus reducing the risk that a participant may be seen and associated with the research study. Finally, the researcher adopted study parameters that have been employed in similar approved studies thus reducing the risk of untried methods for human subject research (Hey & Kimmelman; 2016).

Informed consent

Informed consent is another critical aspect when conducting research on human subjects and has been codified in the Nuremberg Code along with the Belmont Report and 45 CFR 46. Informed consent is both a moral and ethical accountability on the part of the researcher to ensure that the participants are clearly informed of the parameters of the research study, are aware of their rights under the study, and freely consent to participation in the study (Rhodes, 2005). Additionally, informed consent must not include any aspects in which the researcher specifically targets a vulnerable group or individual. Recent regulatory guidelines have included the mentally ill, mentally handicapped, pregnant women, children, prisoners, and the elderly within the vulnerable group category (Rhodes, 2005). For the research study, all participants were adult, mentally competent, and members of either the United States military or a governmental service civilian. All have undergone security background checks and hold clearances at or above the secret level thus attesting to mental competencies and personal character.

The researcher must also guard against coercion within the informed consent process. Here coercion may be any undue influences designed to increase participation within the study confines (Rhodes, 2005). For example, if the researcher were to approach a potential participant and inform them that if they don't participate in the study, the researcher would negatively influence their next performance report then said researcher would be guilty of coercion. Alternatively, the researcher must not appeal to any participant's sense of duty or obligation to improve information technology governance within the Department of Defense as a means to increase participation.

For the research study, the NCU Informed Consent Form was employed. This form clearly described the study to be performed, the risks associated with the study, and the

anticipated benefits from the study. Furthermore, the NCU Informed Consent Form detailed confidentiality actions to ensure anonymity of the participant. Additionally, the NCU Informed Consent Form contained information on how data would be protected from unauthorized use or disclosure and note those personnel with access to the information. Finally, participants were assigned random descriptors that did not allow for correlation between the participant and the information obtained and used for the research study.

The researcher positioned the NCU Informed Consent Form during the early portions of research once IRB approval had been received. In this fashion, the researcher was able to mitigate any non-consensual participation among the study sample. Finally, the researcher clearly articulated to potential participants of the ability to withdraw from the study at any time and with no negative consequences via both personal and written communication.

Privacy, confidentiality, and data handling

The researcher's primary responsibility is to maintain the privacy and confidentiality of participants in research studies (APA, 2017; National Academy of Sciences, 2009). For the research study, privacy of participants was maintained through encryption of electronic data and storage in a password protected storage device. The password was longer than 10 alphanumeric characters and included special characters as well as non-dictionary searchable word combinations. Random descriptors were used during the research process and participants were counseled against revealing too much personal information during any interviews or discussions while the researcher anonymized specific references to Geographic Combatant Commands and determinative processes (Koepsell, Brinkman, & Pont, 2015). Additionally, interview questions were reverse-engineered to determine if the identity of participants may be correlated or inferred (Koepsell, Brinkman, & Pont, 2015). Finally, electronic data will only be kept for three years and

then deleted using a commercial electronic data deletion program designed to remove all data traces.

As part of the interview process, recordings were made for later transcription and coding. As part of the informed consent processes, participants were notified that recordings will be made for use in the research study. Prior to the interviews, participants were again informed of the use of recorded conversations and allowed to withdraw the study if desired (APA, 2017). All generated paper products were stored in a fire-proof safe in the researcher's home. For additional protection, all paper products were transported and stored within a lockable courier bag typically used to transport classified material within the Department of Defense. The key to both the courier bag and the filing cabinet were maintained in separate locations thus reducing the opportunity for negligent disclosure of information. Finally, all paper products will be destroyed after three years using a National Security Agency approved cross-cut shredder. For those interview products that are kept in an electronic form, their storage will mirror secured electronic data storage procedures used for privacy. The data will be maintained for three years and the destruction process will be executed using a commercial electronic data deletion program designed to remove all data traces.

Confidentiality was maintained by following the established guidelines for NCU and other institutional review bodies. Information obtained from the study was only shared with mentors, dissertation chairs, and the minimum required personnel necessary to aid coding and analysis (APA, 2017). All participants were notified in writing at the outset of the participation period of the established confidential measures and all agreed, in writing, that they both understood and accepted the confidentiality measures. This ensured clear lines of communication between researcher and participant thus furthering the professional relationship while maintain a

clear delineation between researcher and participant (APA, 2017; National Academy of Sciences, 2009). Finally, only data that was germane to the study was maintained thereby preserving the integrity of the ethical research process.

Data handling was conducted within standards from 45 CFR 46. Careful segmentation of data occurred between the researcher and those assisting in research (Koepsell, Brinkman, & Pont, 2015). Additionally, all data was anonymized to the maximum extent possible through random generation of participants codes and descriptors. Finally, participants were notified in person and writing that they can withdraw from the study at any time and any data collected would be immediately and irretrievably destroyed (APA, 2017; Koepsell, Brinkman, & Pont, 2015).

Within the environment of privacy and confidentiality, data handing mistakes and negligence were minimized. The use of log books and detailed accounting entries of data access assisted in reducing negligent disclosures with regard to privacy and confidentiality. The use of random descriptors and secured maintenance of both paper and electronic data reduced negligent disclosures and personal mistakes that could result in catastrophic consequences.

Summary

The purpose of this qualitative study was to examine the ITG phenomenon internal to the Geographic Combatant Commands' decision-making processes and to describe the cultural and behavioral frameworks relative to their influence on CCA efficacy requirements. A phenomenological approach was used to determine the extent that behavioral and cultural processes resident in the communities affect, counter to statutory regulation, the efficacy reduction of Geographic Combatant Commands ITG processes. Purposive sampling was used and data collection was conducted via telephonic interviews or personal interviews.

The researcher chose a qualitative approach as the focus of the research study as this methodology more fully allowed the researcher to explore the phenomenon and describe the interplay of social dynamics in a natural setting (Cresswell, 2013; Dane, 2011). The use of phenomenology supported the exploration of culture and behavior within the Geographic Combatant Commands and the consequent impacts to ITG and CCA efficacy. Finally, a quantitative methodology was not pursued as this type of methodology is statistically oriented toward determining correlation or causality (Krathwohl, 2009).

As with many studies involving IT and ITG, the use of a qualitative methodology was seldom employed. However, the literature review highlighted the efficacy of addressing ITG through a methodology that focused on more than statistical analysis and encompassed the cultural, behavioral, and sociological implications resident in ITG. As the interplay of culture and behavior relative to ITG encompasses more than the end-user devices or underlying IT topology, the individual and group perspective on IT implementation and resourcing can easily be influenced by cultural and behavioral patterns resident in the user and decision maker groups.

Finally, assumptions, limitations, delimitations, and ethical assurances are codified. For the researcher, ethical conduct with regard to human subject studies was critical. Informed consent, privacy, confidentiality, and data handling procedures were delineated. Furthermore, an analysis of risk in keeping with 45 CFR 46 was conducted and adhered to throughout the study process.

Chapter 4: Findings

The purpose of this qualitative study was to examine the ITG phenomenon internal to the Geographic Combatant Commands' decision-making processes and to describe the cultural and behavioral frameworks relative to their influence on ITG and CCA efficacy requirements. A phenomenological approach was used to determine the extent that behavioral and cultural processes resident in the military operational community influence, counter to statutory regulation, the subordination of ITG processes. By focusing on the interplay of cultural and behavioral factors, a practical business application can be developed to qualify patterns and impacts on ITG efficacy within DOD organizations. This application then facilitates the decision-making process thereby improving strategic alignment and resource allocation. Finally, the study served to explore and highlight CCA efficacy within Geographic Combatant Commands (GCCs) and explore the intricacies and complexity in applying private sector IT governance practices within a public sector organization.

Moreover, the objective of the study was to explore and identify Service and Joint related normative roles for ITG. Within the public sector, and more specifically DOD, this normative role may or may not be followed given the exigencies of external forces (Min-Seok, et al., 2014; Whitehead et al., 2011). These external forces can be geopolitical or social in nature and the relationships established relative to the participant pool influence the decision-making process. Additionally, the cultural and behavioral attitudes serve to construct prioritization frameworks within the two communities. These prioritization frameworks identify means to utilize resources in differing ways and relate directly to how culture and behavior shape ITG. Furthermore, changing geopolitical dynamics and low probability/high impact events must be included in any strategic alignment and resource allocation decisions and very few studies have explored this

dynamic (Flournoy & Lyons III, 2016; Guttieri, 2014; Héroux & Fortin, 2013; Lake, 2012). Consequently, private sector practices may not serve in the best interest of DOD mission accomplishment and safety of life for military forces.

For this study, a transcendental phenomenological approach was used. Within this construct, the researcher was more focused on description of the experience by the participants as opposed to the hermeneutics phenomenology processes in which the experiences of the researcher are more prevalent (Cresswell, 2013, Yin 2016). The researcher developed a list of 15 interview questions (some with multiple parts) to explore and identify individual Service cultural and behavioral factors that may influence ITG, stakeholder engagement, and CCA application. The questions were further sub-divided into Service background/military decision making, IT governance processes, procedures, and stakeholders at GCCs, and the participants experience with the Clinger-Cohen Act of 1996. Appendix A contains the Call for Participants with associated study participation criteria, Appendix B contains the Informed Consent Template, and Appendix C contains the interview guide employed.

The participants were interviewed during a time of their choosing. Interviews were conducted either face-to-face or telephonically and recorded for transcription. Interview participants consented to both interviews and recording for transcription. All interview participants were assigned a unique participant code determined via a random number generator. Additionally, use of specific Geographic Combatant Command names and internally resident process were generalized to ensure confidentiality. A total of 20 participants volunteered with data saturation occurring by interview number 12. The researcher continued the interview process with all 20 volunteers as a means to ensure adequate data collection and to further explore shared experiences among the participants.

Semi-structured interviews, based on the protocols concurrent through the research domain (Marshall & Rossman, 2006; Seidman, 2006), were employed during the data collection phase. During phenomenological interviews, questions must provide the opportunity for the participant to vividly describe the experience under thus enabling the researcher to discover the underlying meaning and constructs of the event (Englander, 2012). Transcribed interviews were reviewed the first time by the researcher for macro categories and broad themes. A second review was conducted to further refine coding and themes with theming categories focused on word repetition, key words in context, and searches for missing or gaps in information (Cresswell,2013; Krathwohl, 2009). Finally, QSR International's NVivo 12 qualitative data analysis software was used to augment and externally validate data classification, coding, and themes. Figure 3.1 depicts a mind map to further show the relationship between the research questions and the study findings.

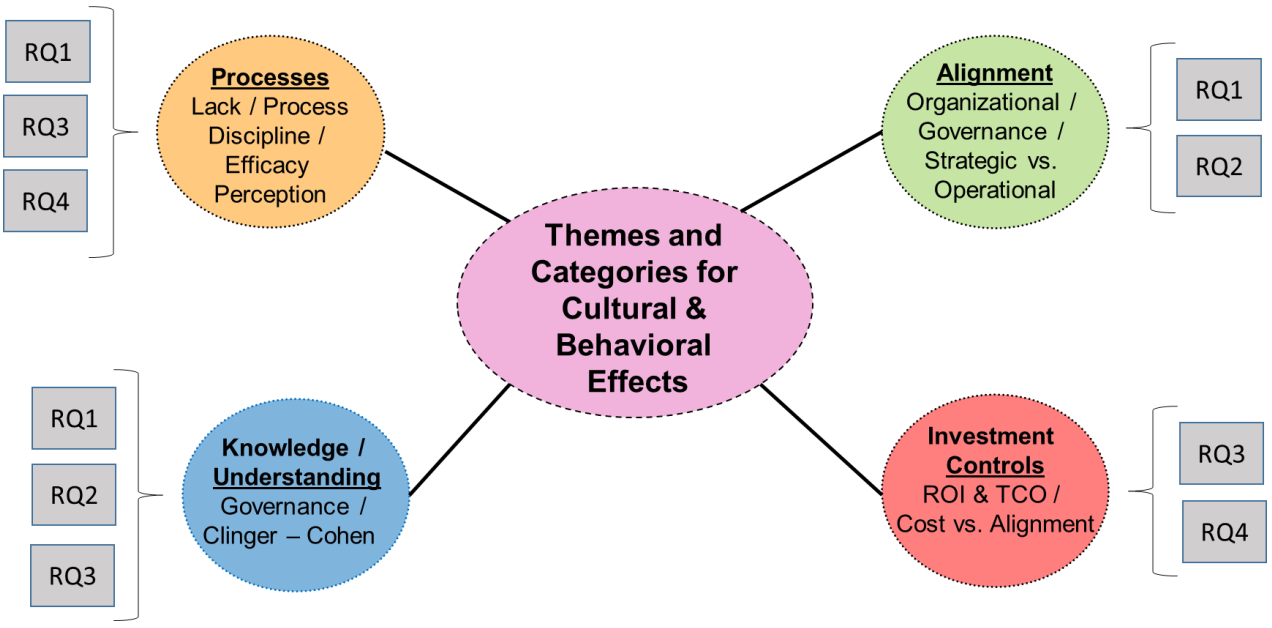


Figure 3-1 Mind-map Relationship between Research Questions and Study Findings

The first section of the chapter focuses on trustworthiness of the data followed by an overall summary of the results. Successive sections detail research question results and detailed explanations of the codes and themes associated with each research question. Finally, an evaluation of the findings is presented.

Trustworthiness of the Data

Trustworthiness in a qualitative study framework assures quality of research by maintaining conventional standards and study protocols to gather and interpret research data thus inferring confidence of study results interpretation (Amankwaa, 2016; Connelly, 2016). Within this study, a qualitative methodology was employed to explore, discuss, and understand a central phenomenon (Cresswell, 2013; Krathwohl, 2009; Yin, 2003). Through the use of broad and general questions, the researcher collected detailed and instructive views from the participants via statements, word images, and impressions which formed the basis for analysis of the context and themes (Cresswell, 2013; Dane, 2011; Krathwohl, 2009). Additionally, employing a qualitative methodology provided for smaller sample sizes than would not normally be found in a quantitative methodology (Cresswell, 2013; Krathwohl, 2009). For the purpose of this phenomenological study, the sample size was deliberately small as the research focused on obtaining and analyzing the participant's perception and attitudes of the IT governance and Clinger-Cohen efficacy. Finally, purposive sampling and snowball sampling were used for selecting participants whom possessed intimate knowledge and understanding of the phenomenon (Cresswell, 2013; Dane, 2011).

Participants were screened to ensure all met the criteria for Geographic Combatant Command experience. All participants served in at least one Geographic Combatant Command with several participants serving in two or more Geographic Combatant Commands. Participants

met the experience criteria noted in the Informed Consent Template and all participants provided a signed and dated Informed Consent Form. Study participant criteria included current or former members of the Operations Directorate (J3) or the Command, Control, Communications, Computers (C4) Directorate (J6) within Geographic Combatant Commands, a familiarity with IT governance processes and procedures, knowledge and experience in military operations, IT acquisition and governance, and with military decision making, and an understanding of the general cultural and behavioral attitudes for military service.

Figure 3.2 summarizes the participant's Geographic Combatant Commands service while Figure 3.3 summarizes the participants Service affiliation. The researcher did not align Service affiliation and Combatant Command as Combatant Command staffs are normally smaller in nature and members are well known with the military community. Aligning Service and specific Geographic Combatant Commands could compromise the confidentiality and anonymity of the participants through reverse-engineering of Service, Combatant Command, and common phraseology of participants used during the interviews.

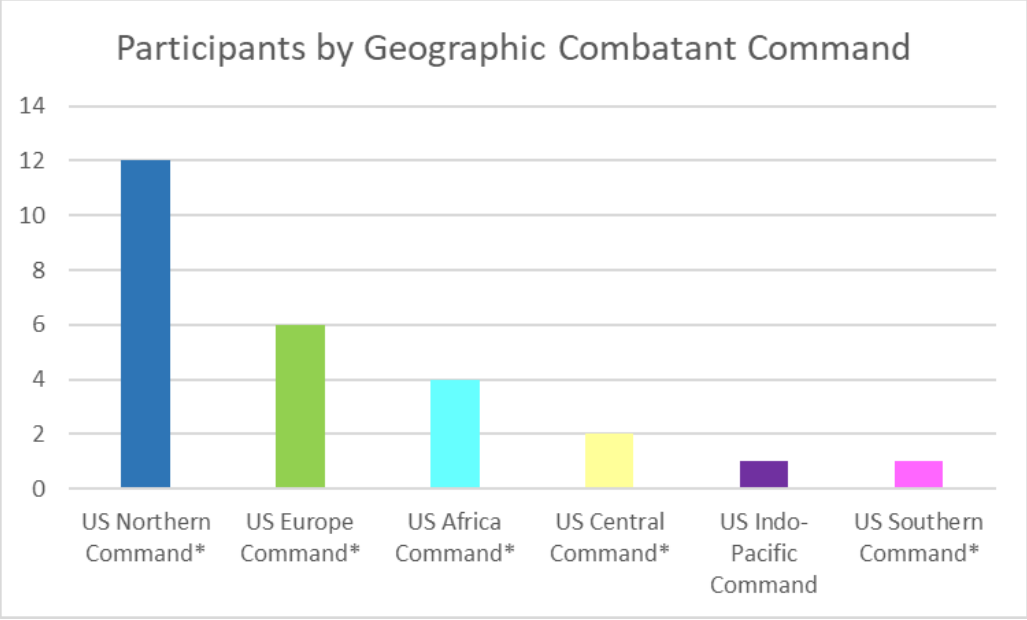


Figure 3-2 Study Participants by Geographic Combatant Command (asterisks denote participants with multiple Combatant Command experience)

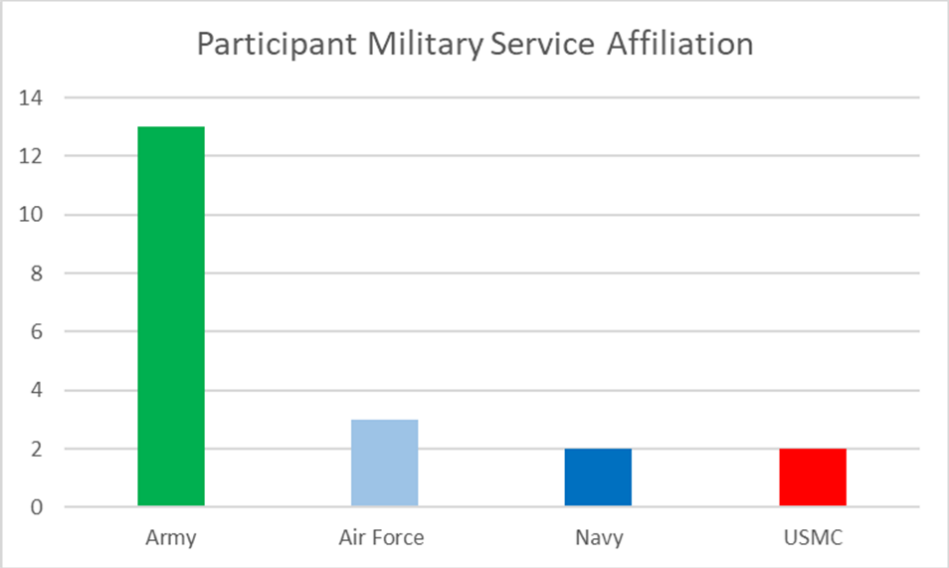


Figure 3-3 Study Participants by Military Service Affiliation

Data was collected via face-to-face and telephonic interviews from 01 June 2019 through 05 September 2019. Appendix D contains the IRB Study Approval and IRB Study Closure Forms. All participants were asked the same open-ended questions and all participants were allowed to ask for clarifications of the questions. The researcher used Socratic dialogue methodology for question clarification as a means to avoid leading the participants toward a certain answer. Furthermore, all participants were allowed to freely discuss answers to the question and all participants were allowed to use stories and anecdotes to enhance their respective narrative.

Research quality and rigor were maintained by focusing on the three major types of validity and reliability. Internal validity was enhanced through the use of pattern analysis and environmental, context, and situation coding. The researcher recorded and transcribed all participant's interviews. Transcription was conducted using ExpressScribe which provided

software and hardware tools to facilitate accurate transcription. Transcriptions were reviewed twice to ensure accuracy and inaudible sections of the transcriptions were reviewed with the participants to increase comprehension and accuracy.

QSR NVivo 12 analytics software was used for coding triangulation and internal validity. Secondary data sources included the federal government's IT Dashboard coupled with the Program Assessment Rating Tool (PART) served as a means of triangulation thereby assuring credibility and dependability. The finalized manuscript combined both the manual coded and thematic outputs with the NVivo 12 software analytics to further ensure internal validity.

External validity was maintained through extensive literature reviews and cross-referencing the research study with other academic or institutional documentation. The interview tool was adapted from previous research on IT governance and Clinger-Cohen compliance within DOD thereby furthering external validity and transferability. However, the study sample was only focused on Geographic Combatant Commands thus reducing overall transferability among other operational forces within DOD. Other researchers and research studies are encouraged to further replicate and refine the exploration of IT governance and Clinger-Cohen efficacy among other organizations within DOD as an additional measure of transferability. Finally, reliability was established by rigorous application of documentation standards and accountability. This process also served to provide the audit trail necessary to be considered credible by all parties.

Confirmability is intended to minimize or eliminate researcher subjectivity and, potential, prejudice inherent in research studies (Connelly 2016). Additionally, confirmability within research should reflect the participants experience with the phenomenon vice conscious or subconscious researcher bias (Amankwaa, 2016). As the researcher is known within the

Geographic Combatant Command community, the potential for reflexivity compromises was inherent. This disadvantage was mitigated through extensive note-taking and transcription during the interview process. Additionally, QSR NVivo 12 analytics software was used for coding triangulation and served to mitigate reflexivity on the part of the researcher.

The second disadvantage was the potential for elite bias. Research participants were primarily highly educated and articulate military officers and governmental civilians. Consequently, there existed a potential for weighting of the data toward more articulate participants or senior officers. As with reflexivity, extensive notes and transcripts coupled with independent data coding were employed to mitigate the potential for elite bias.

Results

The purpose of this qualitative study was to explore the mediating influence of military service related culture and behavior on ITG and CCA efficacy at Geographic Combatant Commands. Results from this study describe the extent that behavioral and cultural processes positively or negatively affect ITG processes. Furthermore, the outcome of this research study may serve to better inform how individual Service cultures may impact decision making, strategic alignment, and resource allocation at Geographic Combatant Commands.

Demographic information was compiled during the interview process. The participant's demographic information is summarized in Table 3.1 found below. Within the sample, 90% of the participants were male (18/20) and 10% were female (2/20). The United States Army comprised the highest percentage of participants at 65% (13/20) with the United States Air Force at 15% (3/20), the both the United States Navy and United States Marine Corps at 10% (2/20 respectively. In comparison, the United States Army comprises approximately 40% (544,744 officer and enlisted) of overall DOD active duty personnel strength with the United States Navy

at approximately 24% (327,372 officers and enlisted), the United States Air Force at approximately 23% (325,563 officers and enlisted), and the United States Marine Corps at approximately 14% (202,786) (United States Department of Defense, 2017a). Furthermore, 50% (10/20) served in the functional role involving IT policy and planning (strategic outlook for a 1-5-year time frame) with 30% (6/10) serving in a C4 or operations role (operational planning and execution for a 72 hour to 6-month time frame) and the remaining 20% (4/20) serving in an IT service management and delivery role (day-to-day delivery and management of resident IT services for the Geographic Combatant Command staff). Finally, the preponderance of the participants fell within an age range of 40-55 years of age (12/20).

Participant Demographics				
Participant	Gender	Age Range	Service Affiliation	Functional Role
P1	Male	55-60	United States Army	Policy / Planning
P2	Male	61+	United States Air Force	Policy / Planning
P3	Male	55-60	United States Army	Policy / Planning
P4	Male	45-50	United States Army	C4 Operations
P5	Male	50-55	United States Army	IT Service Management
P6	Male	40-45	United States Navy	Policy / Planning
P7	Female	30-35	United States Army	C4 Operations
P8	Male	50-55	United States Army	IT Service Management
P9	Male	50-55	United States Army	IT Service Management
P10	Female	50-55	United States Air Force	Policy / Planning
P11	Male	45-50	United States Army	Policy / Planning
P12	Male	35-40	United States Marine Corps	C4 Operations
P13	Male	45-50	United States Army	C4 Operations
P14	Male	45-50	United States Marine Corps	C4 Operations
P15	Male	40-45	United States Army	IT Service Management
P16	Male	55-60	United States Navy	Policy / Planning
P17	Male	61+	United States Army	C4 Operations
P18	Male	40-45	United States Army	Policy / Planning
P19	Male	30-35	United States Army	Policy / Planning
P20	Male	45-50	United States Air Force	Policy / Planning

Table 3-1 Study Participants Demographics

Four macro themes with 15 micro themes emerged in the coding and analysis process. Transcribed interviews were reviewed the first time by the researcher for commonality among

participant's responses with a categorical view based on word repetition, key words in context, and objective reviews for missing or gaps in information indicating sub-textual trends. Table 3.2 summarizes the coding and themes across the research questions and responses and is further discussed for each research question.

Categories	Codes	Micro Themes	Macro Themes
Word Repitition			
	Useful tool	MDMP is effective for problem solving and decision making	Process
	Used for decision making		
	No process	IT investment based on cost and sustainment vice strategic goals	Alignment
	Not used		Service Effects
	Requirements	Stakeholder involvement across Directorates	Process / Alignment
	J3	J3 is primary stakeholder and determines operational requirement	Process / Alignment
	Directorate stakeholders		
	process driven		Alignment
	Operations and requirements		Service Effects
	support operations		
	sustainment		
	capability		
	cost		Process
	POM		
Key Words in Context			
	no strategic alignment	IT governance is basically understood (in most cases)	Knowledge / Understanding
	tools and processes to codify standards	Lack of alignment between IT governance and Command strategic goals	Alignment / Process
	Holy Grail	TCO and ROI complexity inhibits calculus / Not used in governance - IT acquisitions	Knowledge / Understanding/Process/Alignment
	TCO subjective		Knowledge/Understanding
	J3 key stakeholder		
	Service leadership courses/schools	Service training schools similar in scope construct / cultural differences based on service mission	Service Effects
		Service IT requirements vs. CCMD IT requirements	
	decision rights	C4 operations not fully cognizent of IT governance/CCA	Knowledge/Understanding
Searching for Missing Information			
	perception between layers	AO's perception of process efficacy differs from O-5/O-6/O-7	Process
	Tour length - impact to previous decisions	2-3 year tours for senior leaders impacts long-term strategic development/execution	Process/Alignment
	Some experience with CCA	CCA relevance given non-private sector role for DOD	Process/Alignment

Table 3-2 Research Study Codes and Themes

Research Question 1

Research question 1 (RQ1) focused on Clinger-Cohen Act compliance and efficacy. Specifically, RQ1 posed "To what extent do cultural and behavioral influences on organizational

behavior positively or negatively affect Clinger-Cohen Act compliance within the Geographic Combatant Commands?". Several interview questions approached this topic from differing perspectives. The first was general understanding of the CCA and the participant's perspective of whether the CCA was relevant. The second was the participant's perspective on whether the CCA had any impacts on ITG or IT decision making at their respective Geographic Combatant Command. Finally, the participants were asked whether they believed that "your service training or culture influence IT governance and IT investment?". Two significant areas come to light that have both positive and negative effects on ITG and CCA efficacy. The first is the general and basic level of understanding of the legislative requirements for CCA. This basic understanding does not encompass the totality of CCA requirements and, consequently, can manifest in a lack of processes or process discipline that negatively impacts ITG. The second area is related to both internal and external organizational alignment and priorities. In this case, lack of internal or external alignments can cause negative impacts to ITG and result in ad hoc processes and lack of process discipline.

Question 3.1. The majority of the participants seemed to possess a macro level understanding of the CCA with some participants more knowledgeable than others. Participants with a policy and/or strategic planning background were less conversant with the CCA than those participants in the C4, Operations, or IT Service Management functional roles. Here Participant 17 stated

> Well, if I remember correctly, it tried to standardize that process, which was important in those days, because back in those days, not only were the services each different, but even within the services, different commands had different

> processes for acquisition of IT. Well, I would say that it was very important driving a standardization of practice.

Similarly, Participant 4 stated "It was to gain…who has the authority spend what on I.T. I think it was an effort to try to standardize the government procurement systems for this emerging technology and keep us from all going in all kinds of crazy different directions. And I think it's at the top level". Additionally, Participant 10 believed

> Well, it was to try to formalize a key attempt to try to standardize a little bit on the services and making sure that investments were made from a strategic perspective and to focus on a key investment. And you had to include the lifecycle, because the cost of the lifecycle often costs more than the investment. And they wanted to make sure that that people did not go, on complete tangent, where something that else is using a Windows based and then somebody else wants to go on with Macintosh.

In contrast Participant 9 noted "Oh, I would say it really is to eliminate or reduce which IT to buy…I can go back and say that that would have been my answer back then, meaning that even if I were to go read up on it and research it just to give you more, you know, a deeper answer. But that that would be that would be it."

Following on as part of Question 1, the current relevance of the CCA was explored. Although the preponderance of the participants believed that the CCA was still relevant and played an important role in Service and Geographic Combatant Command ITG, there were some exceptions. Notably Participant 13 stated:

> The Clinger-Cohen Act acts on the backside. So I think we're doing a terrible job. You know, if you were to look at defense, business systems process and the I.T.

> part of it, there's not been any efficiency yet. So the idea behind all that stuff was to, gosh, do I need a separate finance system for the Army, Navy, Marines and Air Force? Or do I just need one DOD financial system? Well, obviously, you just need one financial system, but it never, never took hold. And so you can make that argument about, you know, multiple, multiple things as well, e-mail for example. You know, we [United States Army] run enterprise e-mail. The Navy doesn't. So, yeah, it just never worked. We have not gotten the return [on investment]. The intent obviously is good, but for whatever reason, the service cultures are basically done their own thing.

Furthermore, Participant 10 believes:

> I think, from the idea of considering the life cycle and as part of your investment, we have failed to do this as a Combatant Command, but I'm gonna say probably the idea as a whole has failed…So I think that that primary tenet is good. I think the tenet of when they wanted you to have if you're doing a major acquisition, you know, you've got some of these buckets you need to hit or milestones…But I think the wording per say it has not kept up with where we are. So I think for the large part, no, it's not relevant today. There are tenants of it that should be ported over into something that's a little bit more 21st century.

Question 3.2. Question 3.2 asked the participants to respond to whether the CCA had any impacts on ITG or IT decision making at their respective Geographic Combatant Command. In this case the participants were almost evenly split between those that believed the CCA had a direct and positive impact on ITG with the other side of table noting either negligible or negative effects. It is of interest to note that those participants with policy and/or strategic planning as a

functional role generally did not have positive comments; whereas those participants with either a C4 Operations or IT Service Management role believed that the CCA had positive effects on ITG within the Geographic Combatant Commands. This finding could be considered counter-intuitive as those personnel in the policy / planning community are, traditionally, more familiar with legislative and regulatory requirements. Participant 13 stated:

> You know, I'm not going to say it's exclusively the Clinger-Cohen Act. I would just say we do have good I.T. governance process for procurement of the big ticket stuff. I don't know, Jim, if I can give you more, but I feel comfortable we have a process on validating requirements, identifying solutions, vetting those, make sure they're in line with the command and aligning and appropriate funding. It's cumbersome, but it's better here than probably any place I've seen it.

Similarly, Participant 4 noted "Well, it definitely laid out the rules of the road. And the CIO [J6] would lay out for the headquarters what we would want do and where we're headed and how he governed it. It also really helps us to separate the view that the roles of the components".

In contrast, Participant 11 believed:

> I don't think I could point to a specific one that I know was affected by it. Again, maybe in the periphery of some of the documented research for the analysis of alternatives or total cost of ownership, providing at least some level of data or documentation to back up and justify expenses. But again, like a control measure, I don't think I can honestly say that.

Participant 19 noted:

> I don't know that it has directly because it was very clear that the Combatant Command was just there buying stuff and there was no auditing being

> accomplished other than the normal, you know, auditing stuff. There was no return of investment calculated. Like I said, I mean, we had a lot of equipment that aged out still sitting in the warehouse. So if anything just came back, I mean, it was a violation of the Clinger-Cohen Act. There were not at all compliant.

Finally, Participant 15 was not able to articulate any effects of the CCA on their respective Geographic Combatant Command but did note the lack of reference or CCA discussion:

> Again, based on my familiarity with it, I don't know that I can answer that very well…However, Clinger-Cohen was never a phrase or term that I heard much here at the Command and didn't see whether the Combatant Command or Services nested their governance or how they do things within the Clinger-Cohen Act. But it was not a common term that you heard much, if at all.

Question 2.9. Question 2.9 asked the participants to respond to whether they believed their respective service training or culture influenced IT governance and IT investment. As ITG and IT resourcing are foundational to CCA efficacy, the question goes to the heart of the research study. In this case the participants almost universally believed that Service cultures had direct impact to ITG within the Geographic Combatant Command. Moreover, most participants believed their respective Service culture positively influenced decision-making and ITG within their organizations. Additionally, most participants spoke highly of other Service cultures and their influence on ITG. Only two participants felt that their Service culture did not affect ITG within their respective Geographic Combatant Command. Finally, two participants noted the Service resourcing requirements to meet Geographic Combatant Command missions and how that culture impacted IT capabilities for the GCC.

Participant 7 noted:

> I think so even if you're not aware of unconscious bias. So it certainly does. And I certainly noticed that when I worked at the Combatant Command level. Are you an Air Force general officer versus an Army officer or Navy officer? Each of them managed it differently and inherently went back to their own service culture on how they tried to manage things.

Similarly, Participant 16 stated:

> Okay, good. Yeah. I was anticipating this question and eager to answer it. So I think my service training and my upbringing in the Navy helped me bring what I think is a positive governance mentality to I.T. in the following way. So I'll position that against a potential like the way the Air Force culture might look at it or an army culture might look at it. But I would say because in the Navy, you were more independent at the unit level where, you know, ships underway. And, you know, maintaining radio silence. You're not really communicating for OPSEC reasons, but you have to learn how to be ready to make decisions at every level, every grade level, depending on your mission and all that… So my culture of just sort of thinking independently made me feel like, hey, I'm going to fight for a job that I have, and that's going to translate into the overall best practice and best effect for the Combatant Command. And I could just tell you, I've worked with some Air Force guys and I think in this area they're the least likely to have that kind of independent view.

Furthermore, Participant 3 believed:

> I think in assessing the culture of the services, I think it does have an impact. I don't know if I give you some really hard, hard examples of it, but I think in any of the functions, there is a there is a navy way, there is an Army way, etc... I think it's the same with IT. And I think it's very stark… But, you know, anecdotally, I realize as I talk with a guy with an Army background that I talked to, the guy with the Navy background, his experiences in the Navy were tactical communications are different than my experiences would be in the Army. And then we'll have to, you know, normalize on our understanding of what that IT is.

As noted earlier, not all participants believed that Service culture influenced their behavior within their staff role at a Geographic Combatant Command. Participant 15 put it succinctly:

> I don't believe so. Not at a Combatant Command. And I say that because each one had a different, the CIO [J6] was from a different service at Navy and Air Force and Army, and they seemed to follow the same basic concepts such as common sense. And I've worked for Air Force, worked for Navy, worked for Army bosses and alongside folks from all the services. And each one had their own unique perspectives, of course. But when it came to governance and investment decisions, for the most part, ultimately turned out the same.

Within the Combatant Command and Service relational construct, the Services provide forces and capabilities to meet Combatant Command mission areas. Organizational constructs external to the Geographic Combatant Commands creates challenges for both ITG frameworks and CCA efficacy as GCC resources are not necessarily aligned to strategic objectives. Consequently, Service specific directives and ITG policies can have negative effects on GCC

ITG. Participant 13 noted the resourcing dynamic in which capabilities may not always meet Combatant Command requirements:

> The other thing that's problematic with the Service culture is it's so much about how you think about I.T. That's how the resource systems on the backside work. So the way I procure resources for Army I.T. is different than the way the Air Force procures them, is different the way the Marines, and different than the Navy. And so just your ability to plan for things becomes a bit more complex. So in a lot of ways the service bureaucracy that you're aligned against influences how you're grown up, which influences how you execute.

Research Question 2

Research question 1 (RQ2) focused on the effects of age, gender, and Service affiliation on ITG. Specifically, RQ2 posed "Under what conditions do age, gender, and Service affiliation of stakeholders within the Geographic Combatant Commands affect ITG?". Here again, several interview questions approached this topic from differing perspectives. The first area entailed descriptions of individual Service leadership courses, training, and the military making process. The second area focused on stakeholders and/or stakeholder groups that may influence ITG. Relative to RQ2, a general understanding of stakeholder requirements validation as well as a lack of process or process discipline was shown to negatively impacted ITG. However, that is not to say that all Geographic Combatant Commands have similar challenges. Several GCCs have implemented policies and processes to clearly include stakeholders, provide a forum for IT requirements identification and validation, and appropriately resource IT requirements. Finally, as noted in the demographics portion of this chapter, most of the participants fell within the 40-

55-year-old age range and only two participants were female. This serves to negatively impact transferability of the results for this specific question.

Question 1.1 / 1.2 / 1.3. All the participants had undergone military leadership training courses at the enlisted or officer level. The majority of the participants were officers whom had completed several tiered leadership courses. Several of the participants had also completed leadership and supervisory development courses as civilian governmental employees. The preponderance of the participants believed that their leadership training helped prepare them for roles at more senior positions and increased decision making responsibilities. Finally, the majority of the participants felt that their respective Service leadership courses had some similarities in scope and context to other Service courses; however, those specific Service courses were tailored to meet their respective mission areas. Consequently, Service cultures and behaviors may manifest differing effects within the ITG realm. Participant 7 stated:

> I think they differ quite a bit…I had the opportunity to take Air War College so having had firsthand experience of the Air Force, I'll start with them. The Air Force is very much what is referred to as a civilized service or the one that's closest to civilian agency. And the Air Force's mission is very different than the Army. So in the Army, you have to be able, at any time, to lead, you know, troops to charge up a hill. And that's a very different position than most of the Air Force in which their people are fairly far away from the line of fighting…The Marines are the most versatile of the forces and also the smallest. And their training, in my opinion, is much more like the Army culture than it is to the Navy culture.

Similarly, Participant 14 noted:

> From what I understand talking to other service personnel, especially when I was at the Joint Forces Staff College, they do. I think Army and it sounds like Marines focused on personal leadership perspective, whereas I would say that Navy and Air Force don't and would focus more on technical and what you would call the management versus leadership skills…And at the top, it is based on, you know, the service focus and priorities.

One contrasting view from Participant 2 noted:

> I don't think they differ that much. They do a little bit because they're service focused but even in the Naval Postgraduate School, I know a lot of people that have gone there, for an upper level PME or professional military education, and a lot of it is about the same because it is pretty well focused on what you need to do as a leader and gives you the tools to use as you evolve in your military or your civil service career.

Finally, nearly all participants felt the Military Decision Making Process (MDMP) was an extremely useful tool for developing courses of action and solutions for complex problems. The use, or lack thereof, of MDMP is a critical factor that highlights a gap between Total Cost of Ownership and Return on Investment calculations in both this RQ2 and Research Question 3. Here Participant 3 believed:

> So I think, you know, my view is that I find it, in this stage of my career in the Defense Department, I find the military decision making process, one that is helpful both within the military and the Department of Defense. And I find it applicable, where I work, because I think it's methodical and systematic. I think it provides a military decision making process, provides again, a foundation piece of

> understanding and expectation…. You know, there are courses of action that you have to develop and there's a methodology for developing those courses of action that will connect you, or that you consider the factors that you would need to make a solid decision based on the environmental factors and conditions. And again, it just ensures the method ensures that you have widely considered all of the factors involved and trying to come up with courses of action as an example to make the best decision.

Furthermore, Participant 16 believed "Yeah, so the military decision making process is a, it's a very well, again, time honored, cultural driven process that leads ultimately to orders." As most participants noted MDMP was very useful to solving complex problems, one would assume that MDMP would serve as a structured tool for application within the ITG arena. In theory, the use of MDMP could be used to develop or refine stakeholder participation, develop processes for ITG, and implement conditions checks for validation of current and future IT services. However, Participant 19 had a contrasting view on the efficacy of MDMP:

> So I think that in the academic environment for the military, the use of MDMP is all well and good. I think that when it comes to the day to day planning cycles and the things, you know, when the leaders get out of the academic environment, get into the active Army, being a civilian or uniformed, I think that the MDMP mindset goes away and I think they pick and choose when they want to apply it.

Question 2.3 / 2.4 / 2.6. The preponderance of the participants identified stakeholders and stakeholder groups external their individual Directorate. However, processes for gathering and analyzing stakeholder requirements were either non-existent or were not clearly followed. Additionally, the J3 Operations Directorate is considered the primary stakeholder for validation

of IT requirements within the Geographic Combatant Commands. However, the Operations Directorate is not responsible for strategic policy or alignment. Consequently, ITG may be negatively impacted through misalignment to strategic goals of the Geographic Combatant Command. Additionally, strategic alignment will be more thoroughly discussed during Research Question 4.

Stakeholder Theory provided the framework to explore both identification of the stakeholders and how respective stakeholders influence ITG. Here Participant 1 noted "I think for me, my experience, the stakeholders are all the same. We call them J-Dirs but they're the staff from J1, J2, and all the rest". Participant 1 further stated "What their needs are, what their primary focus is, and I'm learning that they're all unique and they all they all have their own unique wants needs and desires and from the [IT] governance aspect I have to make sure that I work with them to ensure that they're getting what they need".

Similarly, Participant 18 believed:

> So I think it's everybody in the organization that should have a piece of it. The J3 certainly should have a large piece of that. The J6 is there, and not only to make sure everybody is operating within all of the department policies and all the laws, but then at the end of the day, take what the Combatant Command has decided is the way forward. Or how they determined to do business and then implement it in that way and assure that capability for the Combatant Commander.

Moreover, Participant 8 noted the process at their GCC for stakeholder involvement and validation of IT requirements:

> This organization is set up so that there are there are standards. Standard requests and nonstandard requests. So if a representative or a customer wants something

> and if it's a standard and it's in our catalog, then the person is approved to get it…If it's a nonstandard meaning, it's not in the catalog then it is reviewed based on a set of criteria and it's assessed at the initial level. If it's proved to be valid, once the requirements are known and understood, it moves to the second area third and then the final level of decision making. Those criteria include such factors as time funding, resourcing specifically meaning labor, both contract and an internal complexity risk.

As noted earlier, the J3 Operations Directorate is considered the primary stakeholder within an ITG construct. Participant 2 puts it succinctly "Well they're the linchpin of what we're trying to provide. If we don't get a valid requirements statement or a clear concise requirement statement from the J3 we may be developing and giving them a tool that is not really useful to them doing their job". Participant 14 echoed similar sentiment "So they are a key stakeholder in [IT] governance because they need that network both for the present and, as they really move forward, the network for the future. It has to support their ability to conduct operations and frankly, it has to support their ability to exercise effective command and control".

However, participants did note that the J3 Operations Directorate may not be as engaged as reasonably prudent thus impacting IT resourcing and prioritization. Participant 11 noted:

> The operators should be included as a part of the process. And I think in theory, in many organizations and again, I would even say from my experience in theory, there is outreach, there is coordination, but it's weaker oftentimes than I think it should be, because the operators are the organization that's going to be providing input on how things are going to be used.

Additionally, Participant 8 believed the stakeholder process and J3 input had been abandoned “That's how the construct is set up. It doesn't work like that…Since 2014, the director and the deputy and those key stakeholders stops supporting the involvement”. This provides an interesting contrast to the process described by Participant Eight earlier. Finally, Participant 8 noted the changing dynamic within the J3 “So I think the J3 especially shies away from it and it's interesting because of the focus on cyber space operations. JP (Joint Publication) 3-12 is a J3 document, not a J6 document for a reason. And again, that really highlights the need for the [J]Three to recognize IT service that directly impacts what operations can do”.

Research Question 3

Research question 3 (RQ3) focused on the effects of Service culture and behavior on resource allocation within Geographic Combatant Commands. As resource allocation is a key component to ITG, misapplication of resources would fundamentally alter effective ITG. Specifically, RQ3 asked “To what extent do cultural and behavioral influences affect IT resource allocation within the Geographic Combatant Commands?”. As with earlier Research Questions, two interview questions were used to elicit participant responses. The first question focused on the alignment of IT procurement and resourcing to GCC strategic goals. The second question explored stakeholder frameworks for IT resourcing and whether Total Cost of Ownership (TCO) and Return on Investment (ROI) calculations are employed. Under the CCA adoption within DOD, TCO and ROI are two means to determine the long-term validity of IT procurement and support effective ITG.

Relative to RQ3, a significant majority of the participants were unaware of any TCO or ROI calculations employed within their respective GCCs. Additionally, almost all the participants noted that IT procurement and resourcing are not aligned with the strategic goals of

the GCC. Furthermore, the CCA is based upon best business practices from the private sector (United States Congress, 1996; US Department of Labor, 2018, US Department of Defense, 2006) in which maximization of capital and resources are a core business practice and the business culture is based on decision making focused on strategic and not political alignment (Al-Farsi & El Haddadeh, 2015). Consequently, ineffective ITG is routinely practiced at many of the GCCs within the study sample independent of Service affiliation or cultural influences.

Question 2.7 / 2.10. As noted earlier, a significant majority or participants did not know or could not describe either stakeholder groups or processes that ensured resource allocation for IT was aligned to strategic goals within the command. Nor were most participants able to identify decision rights allocation within differing stakeholder groups. Moreover, most participants believed that TCO and ROI calculations were either too complex or increased the complexity of decision making thus negatively extending the decision making cycle. Finally, the use of MDMP was clearly identified by nearly all participants as an effective means for addressing complex problems and developing solution sets. However, it does not appear that MDMP was employed for TCO or ROI calculations thus reducing the efficacy of GCC decision making and ITG.

Specific to TCO and ROI calculations, Participant 1 noted internal processes for TCO and ROI were conducted:

> Well we do have our business analyst folks within our J6 and that's the J65. I know that the individual does sit down and does the analytical work on ensuring whether or not this is cost effective. This process makes sense and make sure this IT requirement is something that's needed and it's not just nice to have. A lot of

> people like to look out there and see shiny objects and they want to have it but it doesn't make it through the process.

However, Participant 19, whom worked at the same GCC during the same timeframe, noted quite the opposite "Yes, so I don't. So while I was there, there was there was no framework. It was a hodgepodge of good ideas. And like I stated before. Did we have the money to implement the good idea? And if we did have they bought it? They rarely tracked it to completion". Participant 13 also served at the same GCC during this timeframe and stated:

> They [J6] are not there. They are not. You know, you might get an analysis alternative upfront before you do an initial investment that happens, I'd say probably 50 percent of time, that really depends on the size and the scale. If it's a big procurement, you usually get an analysis alternative. We'll sub that out to somebody who will do that analysis for us. But once it's executed, doing the backside pay and we pay for that stuff. Short of failure of the system, which is pretty straightforward, if you pay for it, it's done.

Similar dichotomies were seen at other GCCs. Here Participant 2 noted "So that is one of the main things that we do is to make sure that as we go forward we're making sure that return on investment is captured so that we can say OK if we do this we don't need the number of servers that may be needed and we can reduce the infrastructure". In contrast, Participant 15 believed "I never really saw total cost of ownership or return on investment as a significant driver for whether anything moved forward or not. However, that was from a formal standpoint…So I saw that we always talked about TCO but I don't ever remember it being a major player being brought up and really quantified".

Additionally, Participant 11 believed:

> And, again, from my perspective, total cost of ownership is a great term that can be very subjective… The problem was there was inconsistency in how those pieces of data were analyzed and developed. And so it was very hard from again, from where I saw, that you could get confidence that the total cost of ownership was comprehensive. And standardized to a point of if you were looking at total cost of ownership for your system. A, where were you making a direct comparison with the total cost of ownership of System B? There was there was far too much inconsistency in the approach and in the method for developing it.

Finally, Participant 9 noted the complexities inherent in TCO and ROI calculations:

> I think the total cost of ownership is one of those Holy Grail concepts and I think all organizations strive for and it takes years. If you look at the ideas and role and try and understand TCO. First, you have to be able to define what are all the elements that are included and when you're going to buy. When you're looking at, you know, I'm spending this many dollars for the specific application, let's say, or this specific piece of hardware. But if you really want to understand the cost of ownership, it goes beyond just what you spend or, you know, those IT equipment pieces.

Question 2.10 asked participants for their number one criteria when purchasing or procuring IT equipment or services. A majority of the participants noted that actual cost and the follow-on sustainment funding were their most important criteria. This determination is counter to IT investment designed to meet strategic objectives. Additionally, several participants noted that available funding was the critical component. In other words, how much money do I have and how much IT can I buy with it? Here Participant 12 stated:

> Sometimes it's not the criteria performance or a key performance parameter that you would see or expect an acquisition objective. It becomes the gap in order to fill the gap. This is what I can afford. And so unfortunately, I think that often gets in the way of using any formal criteria so what do we have available and what can I buy with it?

Participant 7 highlighted the several areas where ITG was negatively impacted including internal processes, focus on initial IT procurement costs, and the lack of planning for sustainment costs:

> I think that's it's only a little better than ad hoc in my organization. I would learn, a lot of times, it seemed that the initial cost was looked at but the long term costs were not always looked at and that was a constant battle. And afterwards someone would be paying the long term costs. Also, there was a demand for some functionality like, hey, we need this right now just to put this in motion. Okay, great. And then after that, like additional money, it was kind of like, okay, now who's going to own this and sustain it? I mean, that often seemed to be an issue.

Participant 16 noted the initial focus on mission requirements but also highlighted the trend toward IT procurement based on the amount of available funding:

> What was the mission? What was the problem we were trying to address or what was the solution set or what was the requirement we were trying to address with the solution? Because otherwise, why are you making an acquisition? But that was me. It didn't seem that way with, you know, with others. Like I said before, someone had a good idea. Do we have the money? Okay, let's spend the money.

Finally, many GCCs had established frameworks for stakeholder engagement and IT investment. The participants were almost equally split between GCCs having effective frameworks and processes and those GCCs that did not have either effective frameworks or processes. Additionally, although several GCCs had established processes for IT investment, process discipline was not maintained thereby negatively impacting ITG within the command. In this case, the findings crossed both gender and Service affiliation indicating no Service related cultural or behavioral effects. Participant 2 noted the positive aspects at his GCC "The answer is yes and we have to do that so that we can make sure that we're doing things that are pertinent and consistent with the with the way ahead". Participant 4 echoed similar positive results:

> So we would put together a strategic plan that would lay out kind of the way forward, trying to go into the next three or five years to determine IT requirements. Each objective would then have a series of sub-objectives of the different programs we're trying to complete and that would help drive us into the POM decision making process.

Additionally, Participant 7 noted the global approach to stakeholder engagement and partnerships with both internal and external organizations:

> The way it works when you're going through the capabilities boards, if you do it, you get a call out to your components and you figure out what they're going to be putting in for the services and the other Combatant Commands. And a lot of it is built on partnerships. So, for instance in both the Geographic Combat Commands I had worked there was a very strong interest in the north and making sure that the Arctic is secure and [we had] secure communications that connected globally. And so we made sure that we had a very strong partnership and that the

> communications for that was built on the strategic framework for what mission could arise.

In contrast, Participant 10 believed:

> None of those processes are working. I don't think we look at a lifecycle because we're still doing things without a view for sustainment, without a view for training, without a view for the impact on our storage capability in the IT shop…. Having said that, the J8 has some of their own standalone systems that they maintain and they get money... And the J6 is not even involved because it's not an externally connected network. They don't come to the J6 for that and they [J8] still have their own I.T. support.

Participant 19 noted the deficiencies within both the framework and the established processes:

> That's a trick question. I think that with the Combatant Command I had, they had no governance. It was whoever had a bright idea. Do we have money for it? If we have money for it, let's spend the money and get it. And then we will see if it's, you know, on track it to completion. And then with when the next bright, shiny object comes along, we'll focus on that and then we'll leave the last one to the wayside, which resulted in a lot, a significant amount of equipment aging out in the warehouse without ever being deployed.

Finally, Participant 11 highlighted the lack of long term strategy for IT investment management:

> Most of what I saw with IT investments was historical use or one-offs, and what I mean by that is that the largest chunk of IT dollars was spent to maintain what had

> been fielded. There were some individual initiatives to do improvements or enhancements, but I didn't know it is what I would call a portfolio. There was there was very little holistic discussion for how much money should be spent in the budget on brand new capabilities, cutting edge type of things versus how much is maintaining the existing system. And so it seemed, again, from my perspective, it seemed to be more where we used X number of dollars in the past. So next year we want X number of dollars plus inflation and only by exceptions were there real investment changes as far as individual IT systems.

Research Question 4

Research question 4 (RQ4) focused on the effects of Service culture and behavior on IT alignment with strategic goals within Geographic Combatant Commands. Similar to resource allocation, alignment of IT to strategic goals for the organization is another key component to ITG. Specifically, RQ4 asked "How do cultural and behavioral structures within the Geographic Combatant Commands affect IT alignment with strategic objectives?". Here one primary research question explored how participants felt both frameworks and stakeholder groups influenced IT alignment to strategic goals. However, as IT alignment with strategic goals or objectives falls under the primary definition of ITG (De Haes & Van Grembergen; 2009) many of the interview questions support differing aspects of ITG under the inclusive banner of IT alignment and strategic approaches. Finally, all participants were asked for their perspective of what IT governance meant to them as a means to determine potential Service or cultural biases toward ITG.

Relative to RQ4, a significant majority of the participants used definitions or phrases that showed an understanding of ITG and this perspective was consistent across all Services.

However, in many cases the Combatant Commander and/or the J3 were identified with determining strategic goals or objectives. As most Combatant Commanders or Directors serve 2-3 year terms, an argument could be made that operational and not strategic goals are the primary focus. Consequently, ITG may not be as comprehensive as required and, both ITG and IT investment, are not properly aligned.

Question 2.2 As noted earlier, the participants had a near universal basic understanding of ITG. In some cases, IT management was used interchangeably with IT governance but this was the exception and not the rule. The descriptions of ITG were consistent across all Services and no Service related inconsistencies were noted. Finally, the majority of the participants linked ITG to both mission requirements and establishing standards for IT investment. Participant 6 believed:

> So to me, that is the framework that kind of wraps around all of that. That further leads to the standards and the procedures that show you how to do what you must do. And I wanted to specify those two different words to how and what goes through your step. Your standards for all of us go toward what must do, which directly lead up to your governance, your policy, where your procedures and laws, which is how you do it. But there is a linkage between them all.

Moreover, Participant 14 stated “IT governance to me means sitting at a Geographic Combatant Command, having the having the ability to establish guidelines and basic, I would call them benchmarks if you will, for what we wanted the theater to achieve from information technology and information technology perspective”. Participant 9 put it succinctly “If you're looking at the organizational level, trying to put in place the processes and the structures to ensure that the agency is being used in a way that is efficient and effective, just enough to meet

the mission requirements without being wasteful". Finally, Participant 19 noted the mission requirements "So governance is the way an organization manages the implementation and support of IT services that relate directly to the mission of the organization".

Question 2.5 This question focused on identifying stakeholder groups and processes that were instrumental in aligning IT investment with the strategic goals for the Geographic Combatant Command. A large preponderance of the participants highlighted a lack of processes and procedures to ensure that IT investment was aligned to their respective strategic goals. Additionally, many participants noted, similar to RQ3, that the misalignment of IT investment contributed negatively to overall ITG and resulted in wasted expenditures at the GCC. Finally, the results indicate that the lack of IT investment alignment with strategic goals crosses all Service backgrounds and cultures. Participant 18 noted:

> So I don't know that they are in my experience, I have not necessarily seen that both at the service level and at the joint level. So an example would be future strategic goals aligned with Combatant Command priorities. Somehow the day-to-day life cycle management and IT management in the headquarters, the networks and the infrastructure, somehow there is sometimes a disconnect there. And so in the planning process, what breaks down is somebody may look to the future and say, hey, we want to do a cloud based architecture. We want cloud based networking for all the all the advantages that that brings to a tool at a Combatant Command. There's all kinds of things need to look at that, not just from a technical perspective, which, of course, the J6 is going to do, but there's a huge money side to that. And sometimes I think there's some confusion whether the

> resource managers are responsible for that or the J6 as the I.T. governance branch, if they're responsible for the procurement and the investment in that.

In a similar vein, Participant 15 stated:

> I wish I could say every time that was the case, but I'm not sure in every instance of this budget. If you look back at many decisions that are made, everyone goes back to what they say the strategic objectives are and how their CIO and the J6 Directorate included that and deciding how the money that is being spent but that is not the case. So at face value, they may not be directly supporting a strategic objective of the combat command.

Finally, Participant 14 noted the Service centricity inherent in IT investment management decisions:

> Well, like I said, it's unfortunate that it's you know, we have we have very service centric networks right now across the Department of Defense. So, again, the geographic command commander, he does not hold the funding. While he has some funds at his disposal, the overwhelming majority of, you know, the investment and the long term funding of I.T., he does not have control over.

However, this was not the case among all Geographic Combatant Commands. At one GCC, both Participant 2 and Participant 16 noted the internal processes and procedures that were consistent with effective ITG. Participant 2 stated “This is a pretty easy one because we do a lot of things with the J8 (Resource Management Directorate within a GCC) and we have to make sure that as we go forward with our defense of our budget that we have credible and compelling definition or mission impact statements that will allow us to effectively defend a requirement”. Participant 16 noted:

> But the whole thing was tied directly to mission, tied to requirements and some of the things that extended out beyond back up to the J6, up to the Commander, to the Joint Staff. and to OSD. So everything was integral. It wasn't like you had rogue kinds of requirements. It was very well governed and disciplined and it allowed for new requirements or emergent requirements to find their way into the conversation and be appropriately dealt with.

Question 2.6 This question focused on identifying stakeholder groups and processes that were instrumental in aligning IT governance with the strategic goals for the Geographic Combatant Command. A majority of the participants noted that effective frameworks were in place to involve all stakeholders and to appropriately align IT with the strategic goals of the GCC. However, this is in direct contradiction to the results of question 2.5. Consequently, the perception of ITG and alignment to strategic goals may not, in fact, be accurate. It is also interesting to note that, similar to question 2.5, the perception of effective frameworks crossed all Service affiliations. Relative to effective frameworks, Participant 3 stated "It is a process that seeks to ensure that IT is needed…that it does support the goals and objectives of the command, and that we prioritize it appropriately". Furthermore, Participant 9 noted:

> There is a written process that occurs in this Combatant Command. You have a branch that is responsible for the strategic plans and architecture and their role and their responsibility is to assess and define where the organization goes from the strategic level and then hand down at a lower. So they will take what is being done supposedly at national level. What is being done to it internally at the four-star level and what the direction is from the Commander to the [J]6. And then

> they will put together a plan to cause a course of actions as well as architecture management and take it down to the next level.

However, Participant 19 believed that effective frameworks were not employed and stated:

> That there was a CAB (Change Advisory Board) that discussed IT strategy implementation and configuration management. But for the most part, I think it was only a kind of a shell because the decisions were already made at some level within the J6 of and there was no engagement from my perspective. There was no opportunity to dissent on something that you did not agree with because the decision was already made. So that board or that the CAB was purely a check the box.

Evaluation of the Findings

The findings for this study were evaluated around the research questions and the resultant coding and themes. The research intended to explore and assess Service cultural and behavioral mores that may either positively or negatively impact ITG and CCA efficacy at Geographic Combatant Command. The open-ended questions provided unique insights into the general understanding of ITG, how ITG and IT investment is implemented at Geographic Combatant Commands, and the efficacy of CCA on GCC ITG. The results shown earlier in this chapter are consistent with the limited previous research and offer new insights into military decision making and ITG processes. The study identified four overarching themes including processes, organizational alignment, general knowledge/understanding, and investment controls.

Within the context of ITG, STH provided the theoretical framework to explore internal and external organizational actors while incorporating the themes of strategic alignment, IT

maturity models, and resource allocation. Additionally, the use of STH allowed the researcher to focus on three principal questions: 1) who are the stakeholders; 2) what do stakeholders want; and 3) how do stakeholders influence ITG (Devos & Van de Ginste, 2015). Finally, STH allowed the researcher to investigate primary constructs, organizational relationships, scope of ITG efficacy, and causal or approximate correlations (Devos & Van de Ginste, 2015).

Theme 1. Processes. Research questions 1, 3, and 4 identified process development and process discipline as key components for ITG. Within the research study, participants noted some instances where processes were fully developed and followed thus improving ITG. However, contrasting points of view were noted by participants within the same GCC. Additionally, participants noted one area where ITG processes and stakeholders were well established and then contradicted their earlier statements during follow-on or related questions. It is also pertinent to note that no GCC has established processes or procedures for TCO or ROI calculations. Finally, Service affiliation and culture were not noted as a determining factor for process development or process discipline. Consequently, the perception of process development and process discipline has not been fully determined.

This is in keeping with research noting the effects of weak standards on ITG by Al-Farsi & El Haddadeh (2015). The study results also closely mirror results found by Min-Seok et al. (2014) with regard to framing the problem and that "…previous studies in the IS field do not provide adequate answers to the question as they do in the private sector setting" (p. 1080). Furthermore, this research study identified parallels between results noted by Al-Farsi & El Haddadeh (2015) and Amali et al. (2014) which showed process related barriers increase ad hoc IT service delivery and governance resulting in overspending on IT investment. Finally, this research study shows a continuing trend toward negative ITG found in the 2018 GAO Report 18-

566T wherein legislatively directed ITG processes and procedures were not followed and which resulted in either significant IT costs or an unfielded IT capability.

Theme 2. Organizational Alignment. Research questions 1 and 2 identified internal alignment challenges and the resultant impact to ITG and CCA efficacy. Within the research study, participants noted Service affiliation, either consciously or subconsciously, impacted ITG within their respective GCCs. Additionally, neither age nor gender was shown to mediate Service-related effects. As this research study was exploratory, not all findings closely aligned or contradicted previous study findings. Furthermore, studies by Amali, Mahmuddin, and Ahmad, (2014), Nfuka and Rusu (2013), Tonelli, et al. (2017), Whitehead et al. (2011), and Wilkin and Chenhall (2010) note that public sector ITG studies relative to strategic alignment have not kept pace with studies conducted within the private sector.

However, there are some areas where this study did note similarities in previous studies. Maintaining clear and long-term strategic objectives were critical for ITG success was noted in studies by Goosen and Rudman (2013), Cegielski et al. (2013), and Whitehead et al. (2011) and this study has shown that operational alignment may not sufficiently establish clear and long-term strategic alignment. Additionally, this study continued the findings noted by Debrency (2013) and Guttieri (2014) relative to internal and external functional alignments in which embracing new and emerging mission activities serve to set conditions for future success.

Theme 3. Investment Controls. Research questions 3 and 4 identified methods and processes for IT investment controls and determined the negative impact to ITG with weak or non-existent control methodologies. Within the research study, nearly all participants noted both the lack of investment controls coupled with the lack of TCO or ROI calculations relative to their respective GCCS. Additionally, many participants noted the complexities of determining TCO

and ROI within the DOD. Finally, several participants noted the individual Services control IT capability investment which, consequently, impacts IT investment and governance at the GCCs.

Similar to public versus private sector studies not keeping pace noted in Theme 2, IT investment controls used in DOD are not normally consistent with those adopted in the private sector. However, this research study confirms findings relative to capturing the efficacy of IT investments by Barua et al. (2010), Obeidat and North (2014), and Petter et al. (2012) coupled with IT's impact on business operations from a cost of ownership perspective and measuring how IT influences the traditional and non-traditional business calculi by Bakshi (2017). Additionally, this study mirrored the complexities with employing private sector IT investment controls within public sector organizations. Specifically, this research continues the conclusions noted by Amali et al. (2014), Dawson, et al. (2016) and Tonelli et al. (2017) in which the differing parameters can serve to complicate deriving value added IT and/or IS solutions coupled with the difficulty in determining success metrics across public sector organizations.

Theme 4. Knowledge/Understanding. Research questions 1, 2, and 3 identified a macro level understanding of ITG and CCA compliance and the effects of Service affiliations on ITG. Almost all participants noted their understanding of CCA and how the CCA influenced ITG within their respective GCCs. Additionally, nearly all participants had positive comments for their sister Services and how the melding of differing Service affiliations supported improved decisions making. Finally, participants noted contrasting views on the efficacy of MDMP for ITG decision making and how investment controls support effective ITG.

Within this theme, the research study was consistent with studies conducted by Flournoy and Lyons III (2016), Guttieri (2014), Héroux and Fortin (2013), and Lake (2012). Here, previous research noted how few studies have explored the interplay associated with changing

geopolitical dynamics and low probability/high impact events relative to ITG and resource allocation decisions. This research study results also mirrored findings relative to developing and determining IT requirements coupled with the differing objectives between public and private sector ITG noted by Iden and Eikebrokk (2014), Korpelainen and Kira (2013), and Lanto Ningrayati, Lillyan, and Sitti (2018). Finally, this research study confirms findings noted by Teodor, Liviu, and Tiberius (2018), Stephenson (2016), and Fraher and Grint (2018) with respect military culture and Service affiliation impacts to decision making at all levels.

Summary

The purpose of this qualitative study was to examine the ITG phenomenon internal to the Geographic Combatant Commands' decision-making processes and to describe the cultural and behavioral frameworks relative to their influence on ITG and CCA efficacy requirements. Furthermore, the objective of the study was to explore and identify Service and Joint related normative roles for ITG. Additionally, the cultural and behavioral attitudes serve to construct prioritization frameworks within the public sector and, more specifically, DOD. These prioritization frameworks identify means to utilize resources in differing ways and relate directly to how culture and behavior shape ITG.

Participant interviews were conducted face-to-face and telephonically and recorded for transcription. All interview participants were assigned a unique participant code determined via a random number generator. Additionally, use of specific Geographic Combatant Command names and internally resident process were generalized to ensure confidentiality. A total of 20 participants volunteered with data saturation occurring by interview number 12. Transcribed interviews were reviewed the first time by the researcher for macro categories and broad themes. A second review was conducted to further refine coding and themes with theming categories

focused on word repetition, key words in context, and searches for missing or gaps in information and, finally, QSR International's NVivo 12 qualitative data analysis software was used to augment and externally validate data classification, coding, and themes.

Four macro themes with 15 micro themes emerged in the coding and analysis process. The research study findings were consistent with previous research on public sector ITG and increased the body of knowledge with an exploratory focus on ITG at Geographic Combatant Commands. Chapter 5 includes implications for these findings as well as recommendations for practice and for future research.

Chapter 5: Implications, Recommendations, and Conclusions

Information technology governance (ITG) within the Department of Defense (DOD) is caught between two conflicting internal frameworks. On one side is the requirement to meet the needs of the warfighter in delivery and managing information technology (IT) services. On the other is the statutory guidance on IT investment management per the Clinger-Cohen Act of 1996 (US Congress, 1996). This Act sets the conditions and requirements for IT investment within the federal government. However, the Act is based on private sector methodologies that can be in conflict with DOD mission requirements relative to information systems capacity, confidentiality, integrity, availability, and redundancy.

Further compounding this dilemma are the cultural and behavioral aspects relative to decision making within the information technology governance (ITG) domain. The differing military services educate and train to service-specific standards that can show considerable differences in understanding and addressing ITG. These training differences thus set the stage for competing philosophies among the principal stakeholder groups and may result in conflicts between legislatively directed processes for ITG and operational or strategic requirements to meet emerging geopolitical events under the purview of the Geographic Combatant Commands.

The research problem can be found in the dichotomy between employment and execution of private sector ITG practices and the furthering contrast within the Department of Defense relative to the operations community and the IT community. On one hand is the requirement to provide for the nation's defense and achieve mission success through strategic objectives and alignment with national policy (US Department of Defense, 2017a). On the other hand, is the requirement to be fiscally responsible for acquisitions and procurement (Eiband, Eveleigh, Holzer, & Sarkani, 2013; McGrath, 2011; Page & State, 2012) relative to IT (Min-Seok et al.,

2014; Nfuka & Rusu, 2013; Whitehead et al., 2011). Compounding this environment is the reality that DOD mission areas tend toward low probability mission sets with high societal/geopolitical impact. Consequently, a state of competing strategic and operational goals can be seen in which the operations community focuses on mission success independently of costs while the IT community focuses on ITG based on private sector models which use a differing calculus for relational attributes between risk management and IT standardization (Amali, Mahmuddin, & Ahmad, 2014; Dawson et al., 2016; Debreceny, 2013; Page & State, 2012; Tonelli et al., 2017; Whitehead et al., 2011).

The purpose of this qualitative study was to examine the ITG phenomenon internal to the Geographic Combatant Commands' decision-making processes and to explore the cultural and behavioral frameworks relative to their influence on ITG and CCA efficacy requirements. A phenomenological approach was used to determine the extent that behavioral and cultural processes resident in the military operational community affect ITG processes. Data was collected through purposive sampling and semi-structured interviews with members of the Association of the United States Army (AUSA), the Armed Forces Communications and Electronics Association (AFCEA), the Signal Corps Regimental Association (SCRA), and LinkedIn. Finally, the assumptions and limitations noted in Chapter Three remained valid.

The researcher developed a list of 15 interview questions (some with multiple parts) to explore and identify individual Service cultural and behavioral factors that may influence ITG, stakeholder engagement, and CCA application. The questions were further sub-divided into Service background/military decision making, IT governance processes, procedures, and stakeholders at GCCs, and the participants experience with the Clinger-Cohen Act of 1996. Transcribed interviews were reviewed the first time by the researcher for macro categories and

broad themes. A second review was conducted to further refine coding and themes with theming categories focused on word repetition, key words in context, and searches for missing or gaps in information (Cresswell,2013; Krathwohl, 2009). Finally, QSR International's NVivo 12 qualitative data analysis software was used to augment and externally validate data classification, coding, and themes.

The research study framed four principal research questions:

- To what extent do cultural and behavioral influences on organizational behavior positively or negatively affect Clinger-Cohen compliance within the Geographic Combatant Commands?
- Under what conditions do age, gender, and Service affiliation of stakeholders within the Geographic Combatant Commands affect ITG?
- To what extent do cultural and behavioral influences affect IT resource allocation within the Geographic Combatant Commands?
- How do cultural and behavioral structures within the Geographic Combatant Commands affect IT alignment with strategic objectives?

Four macro themes with 15 micro themes were identified through analysis and coding of the collected data:

- Theme 1 – Processes
- Theme 2 – Organizational Alignment
- Theme 3 – Investment Controls
- Theme 4 – Knowledge and Understanding

The implications of the study are centered around the four themes noted above. Additional sections in this chapter consist of recommendations for practice and

recommendations for future research. Finally, the chapter is summarized and the dissertation manuscript concluded.

Implications

The first macro theme centered around processes within the Geographic Combatant Commands. Research questions 1, 3, and 4 identified process development and process discipline as key components for ITG. Within the research study, participants noted some instances where processes were fully developed and followed thus improving ITG. However, contrasting points of view were noted by participants within the same Geographic Combatant Command. Additionally, several participants noted one area where ITG processes and stakeholders were well established and then contradicted their earlier statements during follow-on or related questions.

The findings from this theme have notable implications. First, identifiable processes and process discipline has been noted to significantly improve ITG while reducing ad hoc ITG interactions and procedures (Al-Farsi & El Haddadeh, 2015). Moreover, two studies noted process barriers increase ad hoc IT service delivery and governance resulting in overspending on IT investment and delays or cancellation of IT projects (Al-Farsi & El Haddadeh, 2015; Amali et al., 2014). Finally, standardized processes contribute toward increasing levels of organizational maturity. Low maturity models can negatively affect IT standardization and thus negatively impact resource allocation throughout both the private or public sector domain (Héroux & Fortin, 2013; O'Leary, 2009). In the case of two Geographic Combatant Commands, process discipline and low maturity models highlighted where IT decisions were not made collectively nor focused on overarching strategic objectives or stakeholder concerns. Consequently, IT resourcing decisions under the mantle of ITG are not effective toward IT standardization as a whole.

It is also pertinent to note that no Geographic Combatant Command had established processes or procedures for Total Cost of Ownership (TCO) or Return on Investment (ROI) calculations. As IT investment is fundamental toward effective ITG, the lack of IT investment analysis negatively impacts overall ITG within these Geographic Combatant Commands. Additionally, effective employment of IT and IS can facilitate better business processes while improving productivity or reducing labor costs (Petter et al., 2012). IT and/or IS can also be catalysts for new products or services thus reinforcing the pervasive nature of IT and the implicit and explicit benefits toward mission accomplishment (Barua et al., 2010; Min-Seok, et al., 2014).

Finally, nearly all participants felt the Military Decision Making Process (MDMP) was an extremely useful tool for developing courses of action and solutions for complex problems. The use, or lack thereof, of MDMP is a critical factor that highlighted a significant component in the gap between TCO/ROI calculations and ITG. As most participants noted MDMP was a useful framework for solving complex problems, the lack of MDMP use toward TCO and ROI development could not be identified. In theory, the use of MDMP could be used to quantify parameters for TCO and ROI while categorizing and establishing consistent methodologies for associating TCO and ROI for IT projects and initiatives.

The second macro theme centered around organizational alignment. Research questions 1 and 2 identified internal alignment challenges and the resultant impact to ITG and CCA efficacy. Within the research study, participants noted Service affiliation, either consciously or subconsciously, impacted ITG within their respective Geographic Combatant Commands. Furthermore, within the Geographic Combatant Command and Service relational construct, the Services provide forces and capabilities to meet Combatant Command mission areas.

Organizational constructs and alignments external to the Geographic Combatant Commands' creates challenges for both ITG frameworks as Service resources are not necessarily aligned to Geographic Combatant Command strategic objectives. Consequently, Service specific directives and ITG policies can have negative effects on Geographic Combatant Command ITG.

The findings from this theme have notable implications. First, the J3 Operations Directorate is considered the primary stakeholder for validation of IT requirements within the Geographic Combatant Commands. However, the Operations Directorate is not responsible for strategic policy or alignment. Consequently, ITG may be negatively impacted through misalignment to strategic goals of the Geographic Combatant Command. Moreover, how military organizations execute missions can be considered more an expression of culture than the function of the organizational doctrine (Teodor, Liviu, & Tiberius, 2018; Stephenson, 2016). Consequently, the organizational construct which elevates the J3 Operations Directorate over strategic alignment could be a cultural approach which inhibits overall strategic requirements validation.

Second, a majority of the participants noted that effective frameworks were in place to involve all stakeholders and to appropriately align IT with the strategic goals of the Geographic Combatant Command. However, in some cases this finding was found to be in contradiction with previous interview questions. Here the participant's perception of both organizational and stakeholder alignments may not support effective ITG or IT investment decision-making. The complexities involved in developing and establishing effective organizational alignment are consistent with characteristics noted by Grigsby (2011) in which environmental complexity, uncertainty, organizational behavior, and service culture all conspire to reduce the efficacy of intuitive decision-making.

As this research study was exploratory, not all findings were found to closely align or contradict previous study findings. Furthermore, studies by Amali, Mahmuddin, and Ahmad, (2014), Nfuka and Rusu (2013), Tonelli, et al. (2017), Whitehead et al. (2011), and Wilkin and Chenhall (2010) note that public sector ITG studies relative to strategic alignment have not kept pace with studies conducted within the private sector.

However, there are some areas where this study did note similarities in previous studies. Maintaining clear and long-term strategic objectives were critical for ITG success was noted in studies by Goosen and Rudman (2013), Cegielski et al. (2013), and Whitehead et al. (2011) and this study has shown that operational alignment may not sufficiently establish clear and long-term strategic alignment. Additionally, this study continued the findings noted by Debrency (2013) and Guttieri (2014) relative to internal and external functional alignments in which embracing new and emerging mission activities serve to set conditions for future success.

The third macro theme centered around IT investment controls. Research questions 3 and 4 identified methods and processes for IT investment controls and determined the negative impact to ITG with weak or non-existent control methodologies. Within the research study, nearly all participants noted both the lack of investment controls and, as noted earlier, a distinctive lack of TCO or ROI calculations relative to their respective Geographic Combatant Commands. Furthermore, many participants noted the complexities of determining TCO and ROI within DOD which, as noted earlier, could be remediated through the use of MDMP as a framework for solving complex problem sets.

The findings from this theme have notable implications. First, as resource allocation is a key component to ITG, misapplication of resources would fundamentally alter effective ITG. Here many participants noted that IT cost as opposed to strategic objectives determined which IT

services or products to field. This methodology is counter to traditional IT investment calculi and can result in application of IT resources toward less-than-optimal IT solutions. Additionally, aligning IT resourcing toward current organizational problem sets does not set the stage for alignment toward longer-term strategic objectives. Consequently, organizational management and leadership can experience significant challenges developing and implementing IT based on vague or nebulous requirements and the implications are consistent with studies by Iden and Eikebrokk (2014), Korpelainen and Kira (2013), and Lanto Ningrayati, Lillyan, and Sitti (2018).

Similar to public versus private sector studies not keeping pace noted in Theme 2, IT investment controls used in DOD are not normally consistent with those adopted in the private sector. However, this research study confirms findings relative to capturing the efficacy of IT investments by Barua et al. (2010), Obeidat and North (2014), and Petter et al. (2012) coupled with IT's impact on business operations from a cost of ownership perspective and measuring how IT influences the traditional and non-traditional business calculi by Bakshi (2017). Additionally, this study mirrored the complexities with employing private sector IT investment controls within public sector organizations. Specifically, this research continues the conclusions noted by Amali et al. (2014), Dawson, et al. (2016) and Tonelli et al. (2017) in which the differing parameters can serve to complicate deriving value added IT and/or IS solutions coupled with the difficulty in determining success metrics across public sector organizations.

The fourth macro theme centered around individual knowledge and understanding. Research questions 1, 2, and 3 identified a macro level understanding of ITG and the Clinger-Cohen Act compliance and the effects of Service affiliations on ITG. Almost all participants noted their understanding of the CCA and how the CCA influenced ITG within their respective Geographic Combatant Commands. Additionally, nearly all participants had positive comments

for their sister Services and how the melding of differing Service affiliations supported improved decisions making.

The findings from this theme have notable implications. First, it was interesting to note that participants with policy and/or strategic planning as a functional role generally did not have positive comments related to CCA or CCA efficacy; whereas those participants with either a C4 Operations or IT Service Management role believed that the CCA had positive effects on ITG within the Geographic Combatant Commands. This finding could be considered counter-intuitive as those personnel in the policy / planning community are, traditionally, more familiar with legislative and regulatory requirements.

Second, a significant number of the participants believed that Service cultures had direct impact to ITG within the Geographic Combatant Command. Moreover, most participants had positive beliefs relative to Service culture influence on decision-making and ITG within their organizations. Additionally, many participants spoke positively of other Service cultures and their respective influence on ITG. However, two participants did not feel their Service culture affected ITG within their respective Geographic Combatant Command. Consequently, Service culture and behavior has shown mediating impacts toward ITG at Geographic Combatant Commands.

Within this theme, the research study was consistent with studies conducted by Flournoy and Lyons III (2016), Guttieri (2014), Héroux and Fortin (2013), and Lake (2012). Here, previous research noted how few studies have explored the interplay associated with changing geopolitical dynamics and low probability/high impact events relative to ITG. This research study results also mirrored findings relative to developing and determining IT requirements coupled with the differing objectives between public and private sector ITG noted by Iden and

Eikebrokk (2014), Korpelainen and Kira (2013, and Lanto Ningrayati, Lillyan, and Sitti (2018). Finally, this research study confirms findings noted by Teodor, Liviu, and Tiberius (2018), Stephenson (2016), and Fraher and Grint (2018) with respect military culture and Service affiliation impacts to decision making at all levels.

Recommendations for Practice

While IT and information systems (IS) have revolutionized business processes and procedures from a private and public sector perspective (Ahmad, Ghani, & Arshad, 2013; Balocco, Ciappini, & Rangone, 2013, Goosen & Rudman, 2013), ITG still remains elusive within the public sector and defining IT factors that enable organizational success can be challenging (Wu, Straub, & Liang, 2015). Additionally, Service cultural and behavioral factors can either positively or negatively influence ITG depending on the external and internal stakeholders and decision-makers (Lanto Ningrayati et al., 2018; Stephenson, 2016).

One such factor is the differentiation between private and public sector ITG mechanisms with regard to behavioral and cultural norms within public sector environments (Ahmad et al., 2013; Balocco et al., 2013; Goosen & Rudman, 2013; Min-Seok, Tafti, & Krishnan, 2014; Whitehead, Sarkani, & Mazzuchi, 2011). In contrast to the private sector focus on resource allocation and profit maximization, the public sector centers on providing services that are inherently governmental in nature and that address societal behaviors as a whole (Overeem, 2005). Consequently, public sector ITG mechanisms take on differing forms and processes from their private sector partners with the corresponding changes in relational value and utility among the stakeholder groups (Chun et al., 2011; Coleman & Perry, 2011; Dawson, Denford, Williams, Preston, & Desouza, 2016; Min-Seok et al., 2014; Whitehead et al., 2011).

Within the context of ITG at Geographic Combatant Commands, four primary recommendations for practice can be made. First, ITG processes and procedures should be implemented and maintained. These ITG process should include not only the specification and framework of decision rights and accountabilities designed to foster and encourage desirable IT behaviors (Juiz & Toomey, 2015; Selig, 2016) but must also include organizational processes that foster and control the fusion of IT with strategic organizational goals (De Haes & Van Grembergen; 2009). Lack of processes and/or process discipline has been shown, by many participants, to be a detriment to overall IT investment and the alignment of IT toward strategic organizational objectives.

Second, IT investment and resource allocation calculi should be developed and implemented. Almost all participants noted the lack of TCO and ROI and the correlation between effective IT investment and the ability for DOD to successfully gain competitive advantage while improving organizational performance is clearly defined (Barua et al., 2010; Min-Seok, et al., 2014; US Government Accountability Office, 2018b; Whitehead et al., 2011). However, it must be noted that private sector IT investment practices may not be suitable for DOD application. As noted by a significant number of participants and categorized in the literature review, differing calculi and analysis processes need to be developed that take into consideration the unique geopolitical and low probability/high impact environmental conditions experienced by DOD (Bakshi, 2017; Chun et al., 2011; Coleman & Perry, 2011; Dawson et al., 2016).

Third, nearly all participants noted that the J3 Operations Directorate is the principal validation authority for new IT requirements. However, the J5 Plans Directorate is responsible for strategic planning within the Geographic Combatant Commands. Consequently, current and

emerging IT requirements are validated at the operational vice strategic level. Within this context, determinations for current and emerging IT requirements may not be aligned with the strategic goals of the Geographic Combatant Command thus limiting ITG efficacy. Developing and implementing organizational-wide changes focused on J5 validation should improve the linkages between ITG and the strategic objectives for the commands.

Finally, many participants noted a basic level of understanding for both ITG and the CCA. Additional training at Service and Joint schools such as the Command and General Staff Course, Joint Professional Military Education (JPME), and the War College would further knowledge dissemination and understanding of both the principles of ITG and the inter-dynamics between ITG and the CCA. Furthermore, legislative bodies may need to consider the implications inherent in broad legislation that may not be applicable to all federal agencies equally. In this case, the CCA can provide broad measures for ITG but may be considered too restrictive for the dynamic nature of DOD.

Recommendations for Future Research

The findings and recommendations of this study may be useful for Geographic Combatant Commands in furthering and improving ITG efficacy within their respective organizations. However, there currently has been little research conducted on ITG and CCA efficacy within the DOD and even less academic work that seeks to assess the mediating influence of Service-related culture and behavior on ITG processes. This study provided additional insights into ITG at Geographic Combatant Commands while adding to the body of research relative to ITG and public sector organizations. Moreover, the themes identified in the study findings are consistent with previous research within public and private sector organizations.

Based on the findings of this study, there are several areas to pursue for future research. As this study was limited to Geographic Combatant Commands, future researchers could expand the boundaries and include functional Combatant Commands such as United States Strategic Command, United States Special Operations Command, United States Transportation Command, and United States Cyberspace Command. The functional Combatant Commands have global vice regional mission areas which may alter the means and avenues for ITG and CCA compliance. Additionally, the study participants for this study were primarily United States Army personnel. Expanding the participant pool to include more participants of differing Services may serve to further expound upon and augment the current study findings.

Several participants noted the IT acquisition process was conducted at the Service vice Combatant Command level. And although the Geographic Combatant Command have the ability to set conditions for IT acquisition, the Geographic Combatant Commands do not control Service funding or set Service priorities for IT acquisitions. This dichotomy offers expansive opportunities for future researchers to explore the dynamics and prioritization process for IT products and services supporting Geographic Combatant Command mission areas. Within this context, future research may expose areas for ITG improvements that have not been considered either at the Geographic Combatant Command or Department of Defense level.

Finally, the study noted a macro level of knowledge and understanding regarding ITG and the CCA. Future research may focus on ITG training and education within Service and Joint training environments. Within this context, understanding the focus and level of Service and Joint training could expose opportunities for improved training and education for all DOD Departments.

Conclusions

The research study focused on the dichotomy between employment and execution of private sector ITG practices and the furthering contrast within the Department of Defense relative to the operations community and the IT community. The purpose of this qualitative study was to examine the ITG phenomenon internal to the Geographic Combatant Commands' decision-making processes and to describe the cultural and behavioral frameworks relative to their influence on ITG and CCA efficacy requirements. A phenomenological approach was used to determine the extent that behavioral and cultural processes resident in the military operational community affect ITG processes.

The importance of this study in addressing the research problem was designed to gain insight into the affects that Service culture and behavior have on ITG. The study shed light on ITG processes and processes discipline within Geographic Combatant Commands. Additionally, the study highlighted ways that strategic alignment and IT investment impact ITG decision-making. Finally, the study noted levels of knowledge and education relative to ITG within the differing Service Departments of DOD.

The results of this study further contributed to the body of research by exploring an area with previously limited research or academic focus. The recommendations for practice included additional command and senior leader emphasis on process development and process discipline, developing useful calculus for IT investment while improving the alignment of IT with strategic objectives, and increasing Service personnel knowledge and understanding of ITG principles and CCA compliance measures. Finally, future research foci entails expanding the organizational pool to include the functional Combatant Commands, expanding the participant pool to include more Service members from the United States Navy, United States Marine Corps, and the United

States Air Force, and exploring training and education opportunities within Service and Joint level schools or courses.

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Appendices

Appendix A: Call for Participants Letter

Appendix B: Informed Consent Template

Appendix C: Interview Guide / Interview Questions

Appendix D: IRB Study Approval and Closure Notification Forms

Appendix A: Call for Participants Letter

CALL FOR STUDY PARTICIPANTS

Are you curious how Congress impacts how Geographic Combatant Commands make decisions on IT governance processes? If so, this study is for YOU!!

My name is Jim Cronkhite. I am a doctoral student with Northcentral University and this is part of my doctoral program. I am conducting a research study exploring information technology (IT) governance at Geographic Combatant Commands.

1. The purpose of the study is to explore and understand the experiences and thoughts of 20 government IT professionals and how differing service cultures and behavior relate to the Clinger-Cohen Act of 1996.
2. Study volunteers will be asked to participate in individual interviews. The interview seeks your experiences and thoughts of whether service cultures and behavior has influenced IT governance processes in Geographic Combatant Commands.
3. The interview should last no more than 1-hour. The interview will be scheduled when you are available. The interview will be conducted over the phone or Skype.
4. You may choose not to participate or you may withdraw from the study at any time.
5. The results of the research study may be published. Your identity will remain confidential and your name will not be disclosed to any outside party. In this research study, there are no expected risks to you.

If this study has peaked your interest, and you would like to participate, please reply to my email address (j.cronkhite3511@o365.ncu.edu) or contact me at (719) 596-6534.

Appendix B: Informed Consent Template

Introduction:

My name is James Cronkhite. I am a student at Northcentral University. I am conducting a research study exploring information technology (IT) governance at military commands. This study is to explore and understand the experiences and thoughts of 20 government IT professionals on how differing military services relate to the Clinger-Cohen Act of 1996. I am completing this research as part of my doctoral degree. Your participation is completely voluntary. I am seeking your consent to participate and use your interview answers in this study. Reasons you might ***not*** want to participate in the study include concerns with remaining anonymous or a desire not to be involved in research. Reasons you might want to participate in the study include an opportunity to explore how military members make decisions. I am here to answer your questions or concerns during the informed consent process.

PRIVATE INFORMATION

Private information may be collected about you in this study. I will make the following efforts to protect your private information, including:

1. Privacy will be maintained by encrypting your data. Storage will be in a password protected storage device.
2. Random descriptors will be assigned and used during the research process. Participants will be advised not to reveal too much personal information during any interviews or discussions.
3. Interview questions will be designed to eliminate any associations of participant identity.
4. All interview paper products will be stored in a fire-proof safe in the researcher's home.
5. All interview paper products will be destroyed after seven years using a National Security Agency approved cross-cut shredder.
6. Electronic data will be kept for seven years. After seven years, it will be deleted using a commercial electronic data deletion program to remove all data traces.

Even with this effort, there is a chance that your private information may be accidentally released. The chance is small but does exist. You should consider this when deciding whether to participate.

Activities:

If you participate in this research, you will be asked to:

1. Participate in an interview that should last no more than one hour.
2. Agree to tape recording of the interview. You may still participate if you choose not to be taped.

Eligibility:

You may participate in this research if you:

1. Are either military, government civilians, or contractors.
2. Current or former members of the J3 Directorate J6 Directorate within Geographic Combatant Commands.
3. Familiar with the IT governance.
4. Understand the general cultural and behavioral attitudes for military service.
5. Gender, race, and age will not disqualify you.
6. Have knowledge and experience in military operations, IT acquisition and governance, and with military decision making.
7. Participants selected from the Operations community will be graduates of their service leadership programs.
8. Participants selected from the IT community will also be graduates of their service leadership programs. They will also have appropriate training in IT practices and procedures.

You may not participate in this research if you:

1. Do not have knowledge of IT governance, IT acquisition, and military operational decision-making at one of the Geographic Combatant Commands.

I hope to include 20 people in this research.

Risks:

There are minimal risks in this study. Some possible risks include: Accidental disclosure of personnel information that could link the participant to the research study.

To decrease the impact of these risks, you can:

1. Stop participation at any time.
2. Skip any questions you may not wish to answer

Benefits:

If you decide to participate, there are no direct benefits to you.

The potential benefits to others are:

1. Improve understanding of legislative action on military operational support.
2. Improve understanding of how service culture and behavior influence information technology acquisition.
3. Improve understanding of how the Clinger-Cohen Act affects information technology governance within the military.

Confidentiality:

The information you provide will be kept confidential to the extent allowable by law. Some steps I will take to keep your identity confidential are:

1. A random number will be assigned in place of your name.
2. Any references to the timing, location, or Geographic Combatant Commands will be replaced with generic terms.
3. If you choose to withdraw from the study, anything you have provided will be immediately destroyed.

The people who will have access to your information are: myself, my dissertation chair, and my dissertation committee. The Institutional Review Board may also review my research and view your information.

I will secure your information with these steps:

1. All electronic information will be stored on a laptop computer. Only the researcher will have the log-in and password information. The laptop computer will not be connected to the internet.
2. All data files will be encrypted using 256-bit commercial encryption.
3. All written files will be secured in a fire-proof safe. Only the researcher will have the combination to the safe.
4. Transportation of electronic or paper files will be locked within in a standard Department of Defense courier bag. Only the researcher will have the bag key.

I will keep your data for 3 years. Then, I will delete electronic data and destroy paper data.

Audiotaping:

I would like to use a tape recorder to record your responses. You can still participate if you do not wish to be recorded.

Please sign here if I can record you: _____

Contact Information:

If you have questions for me, you can contact me at: J.Cronkhite3511@o365.ncu.edu or at 719-596-6534.

My dissertation chair's name is Dr. Stephanie Menefee. She works at Northcentral University and is supervising me on the research. You can contact her at smenefee@ncu.edu.

If you contact us, you will be providing your phone number or email address. This information will not be linked to your responses.

If you have questions about your rights in the research, or if a problem has occurred, or if you are injured during your participation, please contact the Institutional Review Board at: irb@ncu.edu or 1-888-327-2877 ext. 8014.

Voluntary Participation:

Your participation is voluntary. If you decide not to participate, or if you stop participation after you start, there are no penalties. You will not lose any benefit to which you are otherwise entitled.

Future Research

Any information or specimens collected from you during this research may **not** be used for other research in the future, even if identifying information is removed.

Signature:

A signature indicates you understand this consent form. You will be given a copy of the form for your information.

Participant Signature	Printed Name	Date
_____	_____	_____

Researcher Signature	Printed Name	Date
_____	_____	_____

Appendix C: Interview Guide

Service Background / Military Decision Making:

1. Please describe any military service leadership courses or schools you have taken.

In your own words, what is the focus / main purpose of those courses?

2. Do you feel your individual service courses differ from other sister service courses?

If so, how do you think they differ?

3. Describe your views of the military decision-making process.

IT Governance at Combatant Commands:

1. When were you working at a Combatant Command?

2. From your perspective, what does IT governance mean to you?

3. From your perspective, describe the organizational stakeholders that are involved in IT governance within the combatant command.

4. In your own words, what role does the Operations Community (J3) play in the IT governance process? Please describe any operational impact or decisions that may influence to IT governance.

5. In your own words, describe how IT investment and procurement are aligned to the strategic goals of the combatant command.

6. Is there a strategic framework or stakeholder group that provides guidance on IT alignment with strategic organizational goals? If so, please describe the framework/or process.

7. Describe how your combatant command managed/or manages IT investment.

Is there a structure or framework used for IT investment? If so, please describe the framework.

Are Total Cost of Ownership and Return on Investment analysis used for IT investments? If so, please describe the analysis process.

8. In your own words, describe the tools your combatant command used/or uses to determine which IT projects, systems, or investments to make.

9. Do you believe your service training or culture influence IT governance and IT investment? Why or why not?

10. When you have made (or if you would make) IT purchases, what is your #1 criteria? Why?

Clinger-Cohen Act of 1996:

1. From your perspective, please describe the purpose or significance of the CCA of 1996?

Would you consider the CCA as still relevant today? If so, please explain why you think CCA is still relevant.

2. From your perspective, what impact has the CCA had on IT governance processes at your combatant command?

3. From your perspective, describe the role of the CIO/ or J6 in ensuring IT governance.

Appendix D: IRB Study Approval and Closure Forms

IRB Study Approval

NCU Approved Date Stamp
May 14, 2019

Northcentral University

2488 Historic Decatur Road, Suite 100, San Diego, CA 92106 | www.ncu.edu

Date: May 14, 2019
PI Name: James Cronkhite
Chair Name (if applicable): Stephanie Menefee
Application Type: Initial Submission
Review Level: Exempt - Category 2
Study Title: The Mediating Influence of Culture and Behaviors of Stakeholders Relative to Clinger-Cohen Act Efficacy within Geographic Combatant Commands

Approval Date: May 14, 2019
Expiration Date: May 13, 2020

Dear James:

Congratulations! The purpose of this letter is to inform you that your IRB application has been approved. Your responsibilities include the following:

1. Follow the protocol as approved. If you need to make changes, please submit a modification form requesting approval of any proposed changes before you make them.
2. If there is a consent process in your research, you must use the consent form approved with your final application. Please make sure all participants receive a copy of the consent form.
3. Continuing review is required as long as you are in data collection or if data have not been de-identified. Failure to receive approval of the continuing review before the expiration date means the research must stop immediately.
4. If there are any injuries, problems, or complaints from participants, you must notify the IRB at IRB@ncu.edu within 24 hours.
5. IRB audit of procedures may occur. The IRB will notify you if your study will be audited.
6. When data are collected and de-identified, please submit a study closure form to the IRB.
7. You must maintain current CITI certification until you have submitted a study closure form.
8. If you are a student, please be aware that you must be enrolled in an active dissertation course with NCU in order to collect data.

Congratulations from the NCU IRB. Best wishes as you conduct your research!

Respectfully,

Northcentral University Institutional Review Board
Email: irb@ncu.edu

2488 Historic Decatur Rd., Suite 100, San Diego, CA 92106 USA
www.ncu.edu · p: 928-541-8014 · f: 928-515-5519

IRB Study Closure Notification

INSTITUTIONAL REVIEWBOARD
Northcentral University

View xForm - Protocol/Study Closure Notification

Protocol/Study Closure Notification

Closure Data Entry
- Submitted 9/6/2019 1:52:16 PM ET by Cronkhite, James

Check for NHSR

1. Principal Investigator

Cronkhite, James
Email: J.Cronkhite3511@o365.ncu.edu

1a. Study List:

Study-Site	Role	Title	Sponsor
2019-216-WEBNR	Investigator	The Mediating Influence of Culture and Behaviors of Stakeholders Relative to Clinger-Cohen Act Efficacy within Geographic Combatant Commands	

Closure Details

1. Submitting User:

Cronkhite, James
Email: J.Cronkhite3511@o365.ncu.edu **Business:** 719-596-6534

2. Protocol ID#:

2019-216

3. Protocol/Study Title

The Mediating Influence of Culture and Behaviors of Stakeholders Relative to Clinger-Cohen Act Efficacy within Geographic Combatant Commands

4. Principal Investigator:

Cronkhite, James
Email: J.Cronkhite3511@o365.ncu.edu **Business:** 719-596-6534

5. Dissertation Committee Chair:

Menefee, Stephanie
Email: SMenefee@ncu.edu

6. Faculty Mentor:

N/A

7. Date of Initial IRB Approval:

5/14/2019 for 12 months - Expiration: 5/13/2020

8. Date of Most Recent IRB Approval:

5/14/2019 for 12 months - Expiration: 5/13/2020

9. Please enter the date on which all identifiers were removed from the data and the data were securely stored according to IRB approved procedures:

9/6/2019

10. Closure Summary:

There were no unanticipated changes to protocol or study related events. All IRB protocols were maintained.	*As applicable please summarize any unanticipated changes to protocol or study-related events not previously disclosed to the NCU IRB.*

11. All data have been collected, de-identified, and securely stored per the protocol approved on the IRB approval date above.

Yes	*Please submit this form as soon as your data are collected and de-identified. Please do not wait until completion of the DM to close your study with the IRB.*

13. By entering my password above I attest that I am electronically signing this form and all of the information on this form is accurate and complete and that my research procedures were implemented and completed without deviation from the IRB approved procedures.

Signed Friday, September 6, 2019 1:52:01 PM ET by Cronkhite, James