ADOPTION OF GOVERNANCE, RISK MANAGEMENT, AND COMPLIANCE PRACTICES IN HIGHER EDUCATION INFORMATION TECHNOLOGY

by

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(Under the Direction of Charles B. Knapp)

ABSTRACT

Across the globe and throughout industry, Information Technology governance, risk management and compliance practices (GRC) are becoming institutionalized. In the United States, however, the adoption of IT GRC in higher education remains low relative to its importance. This study looks for the underlying reasons as to why higher education IT GRC adoption is low, and proposes practices and policy changes that may improve GRC adoption. In this qualitative study, the researcher interviews CIO's, CISO's, other IT staff, and other university executives at five institutions in the University System of Georgia for their perspective on the underlying reasons for low IT GRC adoption. Findings indicate that there are organizational change factors involved, and that institutional isomorphism plays a role in IT GRC adoption.

INDEX WORDS: Information technology governance, Information Technology Infrastructure Library, governance, risk management, compliance, Control Objectives for Information and Related technology (COBIT), Organizational Theory, Institutionalism, Isomorphism

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DEDICATION

For Ann and Sheryl

This study is dedicated to my wife, Ann. Without Ann's support in this endeavor and in all my other endeavors over the last 37 years together, I would not be where I am on my education pathway today. This study is also dedicated to the memory of my mother, Sheryl. A powerful influence in my life, my mother always encouraged me to continue my education.

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CHAPTER 1

INTRODUCTION

The adoption of governance, risk management, and compliance practices in U.S. higher education information technology remains low relative to its importance. As higher education in the 21st century becomes more integrated with technology, and institutional data is stored in an increasing number of places, protection of the data and the systems that carry and contain the data becomes increasingly important. Cyber-attacks are on the rise, with one institution reporting "as many as 83 attempts a second to remotely intrude on systems on our network (or about 51 million a week)" (Shipley, 2015, Extent of the Siege section, para. 3). Furthermore, Shipley (2015) believes that higher education is a big target because of the amount of valuable information these institutions store, and the difficulty in protecting such an open environment. As a result, the importance of information security is becoming readily apparent, and information security professionals are in high demand, as are the software and tools to protect computing environments. Regardless, data breaches have become commonplace, and the costs associated with them continue to climb (Ponemon, 2015).

One practice that aids in the mitigation of data breaches and protection of systems is the establishment of information technology (IT) governance, risk management, and compliance programs (GRC). Effective IT GRC programs are prerequisite to an effective information security program, and studies have shown that GRC programs have benefits beyond information security, such as gains in efficiency and alignment with the business (Cater-Steel, Tan, & Toleman, 2009; Iden & Eikebrokk, 2014; Weill & Ross, 2004). Most universities are now

realizing the importance of GRC as it pertains to information security, and perhaps to a lesser degree, information assets. Certain governance components are required by law. For example, many financial information systems must comply with the Sarbanes-Oxley Act of 2002, which requires several change management controls to be in place. While the Sarbanes-Oxley Act (SOX) applies to publically traded companies, other entities, including higher education, feel the impact of the public policy principles promulgated by the legislation. Boards, regulatory bodies, and their associated auditors may use provisions of SOX as models for standards of conduct for financial unit and their associated information systems. Furthermore, these regulatory bodies are realizing that the constituents of higher education have a strong interest in the financial integrity of institutions ("Sarbanes_Oxley_Note_121702.pdf," n.d.). It appears that Sarbanes-Oxley provisions are reaching "best practice" status; auditors and boards in some cases are using components of section 404 of SOX as requirements for proper internal controls. The USG Board of Regents Business Procedures Manual calls for compliance with SOX in the establishment of controls for payroll system access permissions. In addition to the impact of Sarbanes Oxley, some public higher education institutions are now required by the U.S. Department of Education to comply with the Gramm Leach Bliley Act (GLBA) in order to better ensure the management of risk and protection of financial data, specifically the data used in the administration of federal financial aid. The University System of Georgia recently announced guidelines for its tenants to be in compliance with GLBA by January 2018. Despite these pressures and compliance changes, many universities have not adopted strategies to address Information Technology GRC. Bichsel (2014) reports that only approximately 38% of Information Technology (IT) departments at public institutions have risk management programs in place. While a 2013 survey from Educause found that only 10% of respondents implement and execute IT governance very

effectively, more that 25% said their IT governance was ineffective or not in effect (Eden Dahlstrom, 2013) .

IT organizations struggle with implementation of GRC for a variety of reasons. Previous research in this area indicates that executive buy-in and resource constraints are the primary causes (Gacenga, Cater-Steel, & Toleman, 2010; Iden & Eikebrokk, 2014; Iden & Langeland, 2010; Pollard & Cater-Steel, 2009), and others, such as Bhattacharjya and Chang, believe complexity is a factor (Bhattacharjya & Chang, 2006). While 75% of IT executives recognized the requirement for implementing IT governance, only 40% were taking any action in this direction, which may be partially explained by the complexities of implementing IT governance. (Bhattacharjya & Chang, 2006).

While the value of and necessity for higher education IT GRC has been well established, the current adoption in U.S. higher education is low. According to Bichsel (2014), current implementation levels for all three components of GRC is at 12%. IDC reports that there is an upward trend in adoption of GRC practices in US higher education: "over one-half (56%) of IT executives and managers who responded said they are implementing IT Infrastructure Library (ITIL) now or looking to implement ITIL within the next two years" (Brousard,2009). In a cross-national study on adoption, Marrone et al. (2014) found that there is a difference in ITIL adoption rates across industries, with higher levels of adoption in the finance and management services sector and information media and telecommunications sector compared to public sector and education. Not only did the Marrone study find lower adoption of ITIL in the public and education sectors relative to that of corporations, the study also found that ITIL adoption rates in the U.S were lower than in the other countries studied (Marrone, Gacenga, Cater-Steel, Kolbe, & others, 2014).

In one study that shows the void between the need for established GRC practices and reality, Bichsel finds that "there are significant gaps between the importance of specific risks and the effectiveness with which they are being addressed." Her findings also conclude that while most institutions have formal institutional governance in place, only about half have formal IT governance (Bichsel, 2014). Much of the research in IT GRC has occurred outside the US and outside of higher education. There is a good body of research on IT GRC across nations and sectors, including the public sector, including some research on factors that impeded adoption but most of this research does not discuss U.S. higher education specifically. Studies on the implementation and value of frameworks that contribute to IT GRC include studies on ITIL, and control objectives for information and related technology (COBIT). These studies often include information on factors that impede adoption, but there are few on the U.S. higher education market.

The Problem

Information Technology Governance, Risk Management and Compliance practice adoption is low in US higher education relative to other nations and industries, but little research has been done to investigate why. Since establishing GRC practices are shown to improve efficiency, customer service, transparency, audit compliance, reduce risk and aid in the IT to business alignment, many question why adoption is not greater. Some potential reasons are: lack of executive understanding and buy in; lack of IT leadership presence at the cabinet or board level; the impact of institutionalism and organizational change theory; user education and prohibitive costs; and institutional size. While there is some literature on GRC implementation practices and best practices frameworks and their effectiveness, there have been few studies that

include the impediments to adoption of GRC (Cater-Steel, 2009b; Gacenga et al., 2010; Marrone, Gacenga, Cater-Steel, Kolbe, & others, 2014).

Purpose of the Study

Research in this area is important, as understanding the reasons for low GRC adoption can aid in improving adoption practices, which may then improve security, efficiency and customer service in IT. This study searched for the answer to the following research questions:

RQ1:

How do resource constraints, institution size, and executive buy-in and education regarding GRC contribute to the variation in adoption practices?

RQ 2:

How do socio-environmental factors, such as institutionalism, impact the decision to adopt GRC practices? In what ways do organizational change resistance factors, governance structure, or existing IT culture impact the adoption of GRC?

This study used a basic qualitative research model through semi-structured interviews of IT staff and other leaders in higher education to investigate how the factors above impact the adoption of IT GRC. To address this gap in the literature, the research examined the literature available to understand the reasons for low adoption of IT GRC practices in U.S. higher education from the perspective of IT leaders at U.S. universities and colleges using the lens of a current IT leader familiar with some of the challenges associated with IT GRC adoption. This study is significant because lack of proper GRC implementation in higher education is a substantial reason for security risk. Once we develop an understanding of the

factors that contribute to slow adoption of GRC, we can take steps to improve and greatly reduce the security risks in higher education.

In chapter one, I have outlined the problem and research questions guiding my study. In chapter two, I review the relevant literature that informs my study through multiple lenses. Chapter 3 includes a discussion of the research design used in my study. In chapter 4, I discuss the finding from the study and include a discussion of the institutional profiles. Finally, I add a conclusion that covers a summary of findings, study limitations, and areas for future research.

CHAPTER 2

REVIEW OF THE LITERATURE

As one reviews the relevant literature pertaining to IT governance, risk management, and compliance (GRC) adoption, several patterns begin to emerge. The first of these patterns relate to international studies that focus on areas outside of the United States, primarily Australia, the U.K., and other European countries. These studies generally indicate a more advanced adoption than what has occurred in U.S. higher education. The second pattern relates to the benefits and challenges to implementation of the various governance frameworks, such as ITIL and COBIT. I have organized these into two main sections below. A third pattern is one of theoretical lens, and the literature uncovers two main theories that apply; organizational theory, and institutionalization. The latter may be the root cause of several possible reasons for low adoption, and each of these may give indication as to the underlying inhibitors of governance adoption. The literature review that follows has been categorized under each of these headings in the sections below.

International Adoption of GRC Frameworks

While there are gaps in the literature pertaining to GRC adoption rates in U.S. higher education, some studies exist pertaining to adoption of GRC components that provide insight into the issue. These studies typically refer to Information Technology Infrastructure Library (ITIL), Information Technology Service Management (ITSM) or Control Objectives for Information and Related Technologies (COBIT) adoption, all of which are a subset of IT GRC,

and are therefore relevant to this study. Most of these studies have taken place internationally, specifically in Europe and Australia. The purposes and findings of the studies reviewed here generally stand apart from each other.

The literature on international adoption varies in scope and purpose. Some focus on adoption of governance practices (Marrone et al., 2014; Bhattacharjya & Chang, 2006), and some focus on benefits (Marrone and Kolbe, 2011), and others focus on implementation and best practices (Bhattacharjya & Chang, 2006; Iden & Langeland, 2010). Marrone et al (2014) examines the adoption of governance practices through the adoption of ITSM as defined in ITIL. The study focuses on the adoption of operational vs. strategic processes and the contribution of country, size and industry sector to the variance in adoption. The findings from the study indicate that the adoption rate is higher for operational processes and that the adoption rate is higher for German speaking countries. The study also found that adoption varied by institutional size and industrial sector, both of which may contribute to research on GRC practice adoption. Marrone et al use quantitative methods to solve two research questions: "Are operational level ITIL processes more widely adopted compared to tactical/strategic level ITIL processes?" and "Do factors such as country, size, and industry sector contribute to variation in adoption of ITIL processes? While the results are of the study are mixed overall, the answer to the two research questions is yes. These findings inform research on possible factors affecting U.S. higher education adoption, specifically in the area of institutional size

Another study by Marrone and Kolbe (2011) explores the benefits and challenges of implementing ITIL, and lists five related propositions. Marrone and Kolbe include a table of literature and research relevant to the subject, which contributes to the research on GRC adoption. The study uses quantitative methods to produce empirical evidence regarding the five

propositions, and the findings support all but two of them. One fascinating finding is that as the maturity of ITIL implementation increases, the perception of challenges decreases. This could be a contributing factor to low U.S. adoption, if the U.S., specifically higher education, lags on initial uptake of IT GRC, could it be that as the U.S industry matures, adoption will increase? Furthermore, the study indicates that as ITIL maturity increases, so do the realized benefits. Institutions that have not yet matured to a certain level may therefore not fully realize the benefits of GRC adoption, which may inhibit further adoption. Once an institution develops to the point of using metrics to measure outcomes with ITIL, adoption may accelerate (Marrone & Kolbe, 2011). The study's limitations are that it oversamples large enterprises, and is dependent on the quality of the data returned. Neither of the aforementioned studies directly address higher education in the U.S. supporting the concept that there is a gap in the literature (Marrone & Kolbe, 2011).

In an international study that focuses on implementation, Iden & Langeland (2010) provide insight into potential best practices for implementation of ITIL, and summarizes findings from other research and brings them into the study. The relevance of this material to my study is that a potential barrier to ITIL implementation is the process of doing so, which may be a contributing factor to the low adoption rates of ITIL. Contextually, the article does a great job of establishing the critical success factors for implementation of ITIL by flowing from general to specific based on review of existing literature, eventually landing on three common success factors: Management engagement, training and competence, and information and communication. The objective of the study is to develop an authoritative list of factors that need special attention when adopting ITIL. This study includes a table generated from the outcomes of previous research, and then a description of how the study was conducted (Iden & Langeland,

2010). The findings are similar to those of Marrone & Kolbe (2011), and Pollard & Cater-Steel (2009), although the order tends to vary, which is likely due to the differing constructs of the studies, and their varying locations. As the title indicates, the Iden and Langeland piece focused on the Norwegian Armed Forces, therefore limiting the study to one country and one industry, unlike Marrone et al (2014), which covered multiple countries and multiple industries. The Norwegian Armed Forces has a distinctive culture that differs from other industries and nations, thus implying the possibility of different results and prioritization from other industries. As the study indicates in the conclusion, further study in other organizations, public and private, and internationally, are needed. This study does not address higher education in the U.S., reinforcing the fact that a gap exists in the literature (Iden & Langeland, 2010).

Bhattacharjya & Chang (2006) conduct an exploratory study that examines how IT governance is implemented and two Australian institutions of higher education through various processes, and how the various best practice frameworks such as ITIL and COBIT are utilized, and uncovers a number of findings relevant to higher education in Australia. The study also discusses the relationship between IT governance implementation and business benefits. Case studies are used to answer the research question: "How is formal IT governance adopted and implemented within the higher education environment in Australia?" (Bhattacharjya & Chang, 2006). The study finds that the institutions studied benefit after governance implementation in the areas of strategic alignment, value delivery, performance measurement, resource management and risk management (Bhattacharjya & Chang, 2006). The strengths of this study are in its method; a qualitative case study utilizing semi-structured interviews. This method is good for developing a deeper understanding of causes underlying problems in an environment. The sections that develop out the IT history of each institution are instrumental to the study, and

help the reader gain perspective on each case. Unlike the works of Marrone et al (2014) and Iden & Langeland (2010), the study compares only two institutions, and that the research is isolated to one country, Australia. The focus on two institutions of higher education and the methods used inform my research in the U.S.

"An International Analysis of IT Service Management Benefits and Performance Measurements (Gacenga et al., 2010) is a study of the benefits and performance measures of Information Technology Service Management (ITSM) through an International lens. This paper provides an analysis of the benefits and performance measures of implementing governance such as ITSM in Australia, the United Kingdom and the United States. The research questions for the study are: What are the measurable benefits of implementing ITSM? What are the performance measures and frameworks used to determine ITSM benefits? A qualitative and quantitative comparison is made between similar surveys taken in the US, UK and Australia using standard techniques. These techniques include a systematic method for literature review to ensure only studies that are relevant to the benefits and measures of ITSM programs are included. The article finds that there are many benefits of ITSM implementation, but that measurement of the benefits is difficult, which correlates with the findings of Cater-Steel, Tan and Toleman (2006) in Australia, and by Pollard & Cater-Steel (2009) in the U.S. The study also finds that many institutions are going for quick wins, and not implementing all of the necessary ITSM processes. The study differs from those by Marrone et al (2014), Iden &Langeland (2010), and Bhattacharjya & Chang, (2006) in that it focuses on the benefits of adoption of ITSM and performance measures. This study continues to confirm the pattern of a gap relative to a low GRC adoption rate.

The Benefits and Challenges of GRC and the Associated Frameworks

A review of the literature that studies the benefits and challenges of GRC can shed light on the factors that may lead to adoption challenges. The works of Iden and Eikebrokk (2014), Marrone and Kolbe (2011), and Pollard & Cater-Steel (2009) focus in these areas. If we develop an understanding of the benefits and challenges of GRC adoption experienced by those that have implemented frameworks such as ITIL or COBIT, we should be able to see what the common inhibitors to adoption of these practices are.

Iden and Eikebrokk (2014) provide a study on a previous gap in governance research. The study researches how ITIL is positioned in IT governance to provide solutions to process related governance issues, and the organizational factors that enable ITIL implementation. The study uses quantitative methods to evaluate eleven hypotheses, and finds support for seven of them. Most surprisingly, the study finds that senior management involvement in ITIL implementation, while important, is less significant than group efficacy. This finding contradict the findings of others, such as Iden & Langeland (2010). The finding of the importance of team training does align well with the work of Cater-Steel et al (2009). Also surprising is the finding that public firms do not implement ITIL to the same extent as private firms, as the ITIL framework was originally designed for the benefit of public institutions. This finding stands in contradiction to the earlier finding of Cater-Steel et al. (2009), but the limitations of each of these studies may explain the difference in the findings. Despite Iden & Eikebrokk's focus on Nordic companies and the lack of U.S. higher education research, the study complements my research in that the findings clearly support that ITIL is a mechanism for adopting governance practices, and that IT governance can be obtained by enhancing the areas of IT support on a daily basis. So

consequentially, the study finds that IT services can be improved by establishing or enhancing governance through ITIL (Iden & Eikebrokk, 2014).

As mentioned previously, Marrone & Kolbe (2011) explores the benefits and challenges of implementing ITIL, and lists five related propositions. Of significance are the findings related to maturity, in that an increase in maturity correlates to an increase in processes implemented and realized benefits, and a decrease in implementation challenges. These findings contribute to the research on GRC in that the benefits and challenges of governance frameworks are explored, but they do not contribute significantly to low adoption rates in higher education, nor do they address higher education in the U.S. indicating a gap in the available research (Marrone & Kolbe, 2011).

Pollard and Cater-Steel (2009) compare and add to other studies on the critical success factors in ITIL implementations. Unlike the quantitative work of Iden and Eikebrokk (2014), the study uses a qualitative case study methodology in exploring four successful implementations of IT Service Management practices based on ITIL v2, the predecessor to the current version. The reason for using the older version is that ITIL V3 was released in 2007, and at the time of the study, V2 was most prevalent (2009). The study explores why four institutions implemented ITIL; two public and two private; in the U.S. and Australia; the strategies they used; and the critical success factors attributed. The paper concludes with a comparison of critical success factors to previous research and implementation challenges. These finding are in line with those of Iden & Eikebrokk (2014) mentioned earlier, except that the relative importance of senior management support is higher in this study. Some strengths of the study are that a U.S. public institution is involved, new critical success factors are added to previous research, and a comparison of critical success factors is provided. This list of factors is important to the research

on GRC adoption in that they may provide some insight into the low adoption rates of ITIL and ITSM processes in U.S. higher education (Pollard & Cater-Steel, 2009).

Clark and Sitko's research bulletin "Information Security Governance: Standardizing the Practice of Information Security" provides insight into the implementation of an Information Security framework at Georgia State University. The strategy and process used, as well as discussion of challenges and benefits, are valuable to the study of GRC adoption in higher education, as it stressing the importance and value of such initiatives, and then outlines a successful approach. This research bulletin is informative to the subject of governance adoption, and helps inform the discussion, but it is not a scholarly study. While this article does provide supplementary information on IT governance in higher education, it does not address adoption ("Information Security Governance: Standardizing the Practice of Information Security | EDUCAUSE," n.d.).

Up to this point, the literature has led us to a gap in the knowledge of specifically why adoption of GRC in U.S. higher education is low relative to other industries and other countries. Could it be that there is something fundamental to the higher education industry itself? The next section looks at a couple of theories that may indeed impact the uptake of IT GRC.

Theoretical Framework

The need to better understand the reasons behind a lack of GRC adoption in US higher education has been highlighted in the literature reviewed earlier and through data collected by Educause in the annual core data service survey, which indicates an upward trend in GRC adoption, that is, however, slower than the adoption rates in other countries. Two theories inform my research: organizational change theory and institutional theory.

Organizational change theory provides the lens to determine if change adoption itself is the reason behind the lack of GRC adoption. Three research question components, executive buy-in, cultural change and organizational change resistance factors are components of organizational theory.

The organizational change theory lens allows us to look at the phenomenon of low IT GRC adoption in higher education from the perspective of change adoption. Armenakis and Bedeian (Armenakis, 1999) provide a review of 1990's literature on organizational change, including updates on existing organizational theories related to change. The authors view the literature through three lenses: Content, context, and process related. The second theme has the most relevance to this research as it focuses on the forces existing in an organizations environment. Organizations will resist change if the changes are not consistent with the organizations current identity or if an organization adopts a strategic orientation that does not match with that of its external environment. Work by Fernandez and Rainey (2006) adds to this context in the public sector, by pointing to the impact of career civil servants and politicians regarding change. The differing forces that exist in the public sector supplement what is known about change adoption in general, thus informing the study of possible factors that would cause an institution of higher education not to adopt IT GRC.

The institutional theory lens also informs this study. Institutional theory has been used in many cases in an attempt to understand why certain practices are instilled, and why some of these practices become de facto standards across an industry, many times achieving "best-practice" status. Previous work by Cater-Steel, Tan and Toleman (2009b) and Marrone et.al. (2014) used institutional theory to study ITIL adoption in other environments, leaning on the work of DiMaggio and Powell (1983) and Meyer and Rowan (1977) to conclude that ITIL in

particular has become institutionalized in environments where ITIL has been adopted, largely due to three isomorphic pressures: coercive; normative; and mimetic. The study further concluded that "ITIL processes have become fashionable and institutionalised; they have travelled through time and space" (Cater-Steel et al., 2009). Studies such as Cater-Steel's have largely been conducted outside of the U.S., and when the U.S. is included, adoption is shown to lag other nations. So, is it the case that there is a lack of institutionalization of IT GRC in U.S. Higher Education? Could it be that institutionalization of existing frameworks and processes are inhibiting the uptake of IT GRC adoption? Either of these conditions could be contributing factors to low adoption of IT GRC, and this study will explore the effect of institutionalism as it pertains to the low adoption rates of IT GRC in U.S. higher education.

Throughout the literature reviewed and in my professional practice, gauging maturity of governance and conducting a gap analysis between the current state and desired future state is a commonly used approach to building, evaluating, and maturing governance. A common tool that is used in the IT field is the Capability Maturity Model Integration (CMMI). Originally developed by Carnagie Mellon University, the Capability Maturity Model is rooted in software development and was designed to measure and help improve software development processes for the U.S. Department of Defense and industry. The popularity of CMM has become institutionalized in engineering and Information technology practices to the point of the creation of a variety of spin-offs for specific use cases. According to Carnegie Mellon (Team, 2002), this expansion caused a few problems:

> The CMM IntegrationSM project was formed to sort out the problem of using multiple CMMs. The CMMI Product Team's mission was to combine three source models—(1) Capability Maturity Model for Software (SW-CMM) v2.0 draft C, (2) Electronic

> Industries Alliance Interim Standard (EIA/IS) 731, and (3) Integrated Product Development Capability Maturity Model (IPD-CMM) v0.98—into a single improvement framework for use by organizations pursuing enterprise-wide process improvement

As a result, CMMI has become a standard used by many IT and engineering organizations and vendors to determine current process, function or governance maturity compared to a standard, and to aid in the development of future state targets so that gap analysis can be used to develop a path to achieve the future state maturity desired by an organization. The current state assessment process from CMMI can help an organization determine where it is at on a scale of 0 to 5. I used the high level values on this scale to loosely describe the current state of governance maturity at the institutions interviewed. These values are: (1) initial, (2) managed, (3) defined, (4) quantitatively managed, and (5) optimized. Each are described below:

1. Initial – processes unpredictable, poorly controlled, and reactive.
2. Managed – requirements, processes, work products, and services are managed. The status of the work products and the delivery of services are visible to management at defined points.
3. Defined - process is characterized for the organization and is proactive
4. Quantitatively managed – process is measured and controlled
5. Optimizing - focus on process improvement

Full CMMI analysis was beyond the scope of this research, so I used the high-level values to inductively provide a general assessment of the maturity levels of governance based on the interview responses. Again, CMMI is used throughout the research literature on IT GRC, so it serves as a common language indicator of GRC maturity in the field.

Next, I review the literature on organizational theory and institutionalism with a focus on isomorphism and the pressures associated with it in order to understand the implications they may have on IT GRC.

When considering why organizations' structures are what they are, and why the rules or norms involved in the daily work conducted by a business or similar entity are what they are, the effect of organizational theory and institutionalism come to mind as potential contributors. organizational theory has been used in many cases in an attempt to understand why certain practices are instilled, and why some of these practices become de facto standards across an industry, many times achieving "best-practice" status. Organizational theory, and specifically, Institutionalism are likely factors in the current adoption of IT GRC practices in U.S. higher education institutions, and may be a significant roadblock to adoption in others. From a more holistic lens, the works of Meyer and Rowan (1977), Powell and DiMaggio (1991), and Magnusson and Oskarsson (2008) come to mind when discussing organizational change theory and institutionalism, and their work will be reviewed along with the available IT GRC literature.

Previous work by Cater-Steel, Tan and Toleman used institutional theory as "a lens to examine the increasing global diffusion of the Information Technology Infrastructure Library (ITIL) and the motivation of individual organisations to adopt the framework" (2009b). The team used case study techniques to reveal factors that influenced the decisions by managers to adopt ITIL, leaning on the work done by experts in the field of institutional theory to determine its impact on adoption. Through the interview process, the motivating factors for adoption were collected and analyzed, then categorized according to the appropriate isomorphic pressure as defined by Dimaggio and Powell (1991). These pressures are classified as mimetic, normative,

or coercive. Cater Steel et al (2009) concluded that "Using institutional theory as a lens, the analysis at both field and organisation level supports the view that ITIL processes have become fashionable and institutionalised; they have travelled through time and space", and three pressures have influenced isomorphic adoption of ITIL. Could it be then, that institutionalization of current organizations and their processes where absent ITIL reduces the likelihood of ITIL adoption? Could this be the case with IT GRC practices in general? Clearly, a deeper understanding of Institutional theory is needed to understand the implications of the Cater-Steel, Tan and Toleman piece reviewed above. We start by looking a little more closely at Meyer and Rowan's work from 1977. In this piece, the authors describe how "Institutional rules function as myths which organizations incorporate, gaining legitimacy, resources, stability, and enhanced survival prospects" and how organizations form practices and procedures defined by rationalized concepts that become institutionalized (Meyer & Rowan, 1977). Cater-Steel, Tan and Toleman (2009) view the adoption of ITIL through the lens developed by Meyer and Rowan in the conduct of their study to conclude that ITIL has become institutionalized, and that the isomorphic pressures pertaining to institutionalization identified by Dimaggio and Powell (1983), are instrumental in the process. Leaning on these bodies of work, Cater Steel et al. show that institutionalism and the isomorphic pressures push the adoption of ITIL, but the studies do not indicate why many institutions still do not adopt the framework. I speculate here that a barrier to ITIL adoption may be institutionalism of existing processes and structures, in effect that Institutionalization can work both for and against ITIL adoption.

Meyer and Rowan (1977) explain the institutional sources of formal structure, including rationalized structures, which run counter to the classic Weberian description. They explain the role of public opinion and social prestige, as well as the views of constituents of an organization,

developing the case that rationalized myths are instrumental in the development of formalized structure. Rationalization of existing processes likely creates the internal belief that what is currently being done works, whether the processes and work methods are being adhered to not. In fact, two of Meyer and Rowan's six propositions (listed in table 3), speak directly to the institutionalization of environments: (1) "The more an organization's structure is derived from institutionalized myths, the more it maintains elaborate displays of confidence, satisfaction, and good faith, internally and externally," and (2) "Institutionalized organizations seek to minimize inspection and evaluation by both internal managers and external constituents." This seemingly indicates that the organic development of an organization over time, when internally gauged as successful, contributes to the institutionalization of existing process, whether they are efficient, effective and compliant, or not. Could it be then, that once a process is institutionalized to a high degree, that change to another process is unlikely, even if the evidence as to the latter's benefit is strong? It is then, Meyer and Rowan's considered opinion that modern institutions are rationalized, and act as myths giving rise to more formal organization. As indicated by Cater-Steel et al., this supports the concept that institutionalism may positively impact the adoption of GRC practices such as ITIL through the isomorphic pressures defined by Dimaggio and Powell (1983).

Meyer and Rowan (1977) define the impact of institutional environments on organizations, including the isomorphic impact of organizational language; basically that as processes are institutionalized, the common language of the organization changes to reflect it, which helps to further institutionalize them. The propositions provided by Meyer and Rowan may support the notion that the current institutionalized state of an organization may be hard to

change and re-institutionalize in another way, and this could be impactful in the area of IT GRC. Further study is needed in this area to determine if the latter is true.

As indicated by Cater-Steel, another study that contributes to an understanding of Institutional theory and its potential impact on IT GRC adoption is "The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields" by DiMaggio and Powell (1983). This document contains a detailed discussion of the isomorphic pressures mentioned previously. In the beginning, DiMaggio and Powell provide background on Weber's "Iron Cage" as it pertains to their beliefs on the current state of bureaucratization and rationalization, explaining that the causes have changed over time, and that now they "…occur as the result of processes that make organizations more similar without necessarily making them more efficient" (Dimaggio, & Powell, 1983). The authors continue with more background, including a discussion on homogeneity, or why we seem to seek it, and then discuss that as an innovation spreads, it reaches a point where adoption provides legitimacy rather than efficiency (DiMaggio & Powell, 1983). This is readily apparent in the adoption of best practices, where organizations adopt structures and processes that are popular in industry, sometimes regardless of actual benefit.

DiMaggio and Powell begin the discussion on isomorphism: "The concept that best captures the process of homogenization is isomorphism. In Hawley's (1968) description, isomorphism is a constraining process that forces one unit in a population to resemble other units that face the same set of environmental conditions" (DiMaggio & Powell, 1983). The authors go on to discuss two forms of isomorphism, competitive and institutional, where they identify that institutional isomorphism is where the difference lies that addresses the changes that have occurred since Weber's work. Next, they introduce the three isomorphic forces: coercive,

normative, and mimetic. The authors contend that these forces are the mechanisms that cause institutional isomorphic change to occur. Each of these forces is described with examples given.

DiMaggio and Powell (1983) discuss the predictors of isomorphic change, where they postulate a number of hypothesis, categorized as "Organizational-level predictors" and "Field-level predictors." Cater-Steel, Tan and Toleman use these predictors as an instrument in their case studies to determine the effect of isomorphic pressures on the adoption of ITIL. There is much evidence that supports the hypothesis proposed by Dimaggio and Powell, although all may not apply in all cases. The primary argument made in the end by DiMaggio and Powell is "…that a theory of institutional isomorphism may help explain the observations that organizations are becoming more homogeneous, and that elites often get their way, while at the same time enabling us to understand the irrationality, the frustration of power, and the lack of innovation that are so commonplace in organizational life. What is more, our approach is more consonant with the ethnographic and theoretical literature on how organizations work than are either functionalist or elite theories of organizational change" (1983).

The DiMaggio and Powell piece certainly informs the research pertaining to the adoption of IT GRC practices in higher education information technology in that it gives us the necessary background to understand institutional isomorphism and the three isomorphic pressures: coercive, mimetic, and normative. The impact of these isomorphic pressures on the adoption of ITIL were studied by Cater-Steel, Tan and Toleman (2009), but from the post adoption perspective. What impact does institutional isomorphism have on the low adoption of IT GRC in U.S. higher education? Is the current state of institutionalism of current structure and process an impediment to adoption? More study is needed in this area in order to make that determination.

"The Role of External Influences on Organizational Information Security Practices: An Institutional Perspective" is a piece written by Qing Hu, Paul Hart, and Donna Cooke in 2006. This article aligns well with the study of adoption of IT GRC practices, although its focus is specific to information security at one firm in the private sector. The introduction provides information on the problem, and insight on the state of information security in industry, making a strong case for the growing concerns regarding the problems securing environments from external and internal threats. The authors shed light on the fact that " The security of data and networks can only be as good as the weakest link in the entire system" (Hu, Hart, & Cooke, 2006), explaining that technology can only go so far in providing for information security, and that organizational factors contribute significantly to the threats posed to information and systems. The authors then describe the purpose of their research: "The focus of this research is an attempt to answer the question: what are the socio-organizational factors that affect the security of information and systems?" (Hu et al., 2006), they then further explain that information security requires a combination of technology and organizational components in order to succeed. The article provides information on the prior research in the area of information security acceptance and institutional theory, then references and summarizes the work of Meyers and Rowan (1977) and that of DiMaggio and Powell (1983) among others in an attempt to provide background information on Institutional theory and institutional isomorphism. In the discussion of institutional isomorphism, the paper provides appropriate detail of the three mechanisms of isomorphism. The purpose of the interviews in the study was to "...identify the primary organizational factors that impacted the security of information and networks in the focal organization and to analyze the interactions among these factors using the roadmap of the institutional theory framework" (Hu et al., 2006).

Hu, Hart and Cooke discuss their main findings, first highlighting perhaps the most major one, “the business does not view security as a high priority,” which seems to be a theme throughout industry, and then state the fundamental problem: “Since data and network security has been in the headlines since the Internet boom started in the 1990s, one would also wonder why there are still so many well managed organizations that have become victims of security attacks” (Hu et al., 2006). Excerpts from the interviews establish a case that supports two of the three isomorphic forces, coercive and normative. Little evidence is produced that supports mimetic isomorphism in the cases, but as the authors indicate, this may be the case in general relative to information security which they attribute to three possible causes: “ First, mimetic behavior occurs when there are peer organizations perceived to be successful and the success is generally attributed to certain actions or behavior, the so-called “bandwagon effect” secondly, “…that organizations rarely publicize their security practices due to the very nature of security, thus creating an environment where little is available to mimic” and finally “it is also possible that the interview questions we used failed to reveal the true influence of mimetic forces”(Hu et al., 2006). The lack of mimetic pressure discovered here could be an area of focus regarding other GRC components as well. Cater-Steel et al indicated that the three pressures were evident in entities that had adopted ITIL, so it is worth noting that if mimetic pressure is not sufficiently present, adoption may slow or be non-existent. Hu et al then go on to discuss the role of awareness, which was not a part of their original study, but was a topic that apparently came up a great deal during the in the interviews. In their discussion, they identified that there is an assumption made by non-IT staff that IT was doing all they could to ensure information security, and that to some degree the same can be said for non-security IT staff, who assumed that Information security staff were solely responsible for security (Hu et al., 2006).

In conclusion, the Hu et al review their methodology and reinforce their argument that "…based on the findings of this case study, that the root causes of insecurity in corporate data and systems can be attributed to the low priority of the security issues in the minds of top management teams and the tendency to maintain the status quo as long as there are no major security incidents occurring" and further state that the low priority is a result of two factors, unawareness and resources, the former being based on an assumption that information security is an IT problem, and the latter that resources can be better spent elsewhere (Hu et al., 2006). In the end, the authors found that institutional theory worked well for explaining managerial behavior in the case company, and added that study of the theory of planned behavior may be well suited for studies on individual behavior regarding information security (Hu et al., 2006). While not a study on higher education adoption of IT GRC, the Hu, Hart and Cook piece does inform my research and provides valuable insight into my studies. It is likely that there is similar effect in higher education due to the human aspect and assumptions made by individuals studied.

Thus far, the literature reviewed has been oriented on organizational and institutional theory as it pertains to information technology. Another perspective on the issue comes from the state of governance of higher education itself, which is quite fascinating in that higher education governance is complex, varied and dynamic. An excellent orientation to the recent and current state of higher education governance can be found in Hearn and McLendon's "Governance Research: From Adolescence to Maturity" (2012), which provides a broad overview of the past and recent research into the governance of higher education, explores some of the more recent theories, and then suggests areas for continued research. While the subject matter is not specific to institutional theory, the paper does inform my research on the topic, in that it specifically

addresses various models of governance and organizational theory behind them relative to higher education.

McLendon and Hearn discuss the governance literature pre-1980. They begin by providing an overview of the previous three lenses through which governance in higher education was viewed prior to 1980: formal-rational or bureaucratic models, collegial or "professional bureaucratic" models, and political models. Formal-rational models lend themselves to governance model frameworks such as ITIL, and political models tend to work well in changing environments. The authors then discuss the impact of machine bureaucracy during this time period, and that much of the literature covers how post-secondary education tended to defy the model (Hearn & McLendon, 2012). Hearn and McLendon then describe the rise of the concept of collegium, which may have been developed in part to explain the perceived failings of the bureaucratic model. The collegium description paints a picture of a model that appears nearly the opposite of a bureaucratic environment, which could be an indication of the root cause of resistance to processes that involve machine bureaucracy, such as ITIL and other GRC frameworks. McLendon and Hearn refer to the work of Clark (1992) who "…argued that these forces were sufficiently profound to encourage, over time, the development of a distinctive organizational character, which he famously termed an "organizational saga". Such institutionalization of organizational character may have an impact on the adoption of changes. The paper then moves into a discussion of the impact of the political model, and the impact of power and group conflict, and how the model is an important factor regarding the implementation of change in an institution. The struggle between the models, along with other organizational forces, likely have an impact on adoption of governance practices.

Next, the authors provide an overview of garbage can and loosely coupled models, summarizing the models proposed by Cohen, March and Olsen (1972), and Weick (1976). These models attempt to describe the phenomenon that is higher education governance, seemingly by observing the behavior of these somewhat non-rational and unorganized systems in an attempt to define what makes them work effectively without bureaucratic controls and hierarchical structures. Hearn and McLendon also include criticisms of the work on organized anarchy and garbage can theory, and add that "…the undeniably provocative organized anarchy and garbage can ideas have clearly aided understanding of postsecondary organization" (Hearn & McLendon, 2012). This "organized anarchy", utilizing garbage can theory as a method of problem solving and governance, runs counter to organized governance structures, and therefore may affect adoption of governance problems in several ways: the change to adopt new governance may need to align to the four "streams" involved in garbage can theory, and the institutionalization of garbage can theory itself may cause resistance to adoption of governance models that are bureaucratic in nature. The piece then turns to a discussion of loose coupling and the work of Weick (1976). The authors describe that Weick "portrayed school and college systems as a counterconventional organizational form characterized by their lack of rationality, efficiency, tidiness, and tightly coordinated structures aimed towards goal attainment"(Hearn & McLendon, 2012). Hearn and McLendon continue to summarize the Weick's work on loosely coupled systems, explaining the benefits as described by Weick, and the contrast to the bureaucratic and political models from earlier studies. Loose coupling is a phenomena that is evident in institutionalized environments, and can lend itself to a failure to accurately measure performance and efficiency, which can lead to a belief that all is well, and there is no valid reason to change. Therefore, loose coupling can impact the adoption of new processes.

Hearn and McLendon discuss the emerging research literature on governance discussed at the unit level, primarily focused on academic departments. The authors comment here that "The most significant governance activity on campuses arguably occurs not at the institutional level but at the level of the academic subunits on campus…" (2012), setting the tone for what follows concerning the primary area of authority for faculty. The authors refer to the works of Clark (1987), Massey, Wilger and Colbeck (1994), and Massey and Zemsky (1997) in describing the faculty's role in departmental governance. Massey's (1996) "academic rachet" effect is described, which argues that decentralizing governance at the unit level increases costs as faculty act to protect their interests, and Hearn and Anderson's (2002) finding that "…consensual unanimity was harder to achieve in units with low levels of disciplinary knowledge development and agreement". The authors then mention the work of Braxton and Hargens (1996), who found that "departments in high consensus fields such as physics tend to be more efficient, to be less conflicted, to change and adapt more easily, to exhibit less turnover, to be more collaborative in publications, and to be more effective in achieving certain goals and obtaining financial and human resources, compared with units in low consensus fields such as sociology". So, does the perceived "loose coupling" here have a mimetic effect on non-academic departments? If so, does it contribute to the lack of adoption of governance practices perceived as bureaucratic? Hearn and McLendon express concern "that the imposition of rationalistic, managerial ideologies threatens academic institutions' most valuable features: ambiguity of authority, openness to innovation and creativity, and normative commitment to democratic governance." So if faculty in particular and the academy in general feel threated by governance methodologies, then adoption of such practices could face significant opposition. This is a potential area of study for possible impact on IT GRC adoption in higher education.

The impact of state level governance on IT GRC may be a significant factor in the adoption of IT GRC practices. States vary in the structure, design and authority of higher education governing boards. McLendon and Hearn discuss the history of the research in the area of governing board types, reviewing the work of Glenny (1959) and Moos & Roorke (1959). Glenny reviews statewide organization of boards by type: voluntary coordination, statewide coordination, and consolidated governance. The difference in the way these different board types operate may have an effect on the adoption of GRC. The statewide coordinating boards tend to operate in a more influential manner, attempting to meet the needs espoused by the legislature and governor while minimizing government intrusion. The consolidated governing boards, according to Glenny, were cause for concern because of their "onerous regulatory controls". The latter approach would seemingly be helpful in forcing adoption of IT GRC, which would be an indicator of coercive isomorphism, provided the board prioritized such an initiative; whereas the coordinating board approach may be less effective at ensuring adoption of IT GRC because of its minimal intrusion approach, as well as the fact that the periodic change in constituency in the legislature would cause shifting priorities to reduce the likelihood of adoption. McLendon and Hearn indicate reinforcement of this in their review of Lowry (2001) "Lowry reasoned that regulatory coordinating boards essentially are extensions of governors' capacity to supervise because governors appoint board members. Thus regulatory boards should be found to behave in a manner generally consistent with the preferences of governors (and voters), leading to lower tuition levels. In contrast, governance structures lacking such direct political oversight (e.g., consolidated governing boards) should tend to institutionalize the preferences of faculty and administrators, resulting in higher tuition levels." While Lowery used tuition levels in the context of the research, the same principles could apply to IT GRC adoption.

Further confirmation of the impact of board type is found as McLendon and Hearn refer to McLendon's work: "…we have found that the consolidated governing board arrangement often has a strong, statistically significant effect on governmental adoption of certain new policies, including more rigorous performance-accountability mandates (Mclendon et al., 2006). Further investigation is needed into the impact of governing board type on adoption of IT GRC (McLendon & Hearn 2012).

Hearn and McLendon then discuss governance at the regional, disciplinary and national levels, which some would argue does not or should not exist, but it does. The authors discuss the effects of accrediting bodies, federal financial aid and grants, etc. and research in these areas. These accrediting and funding bodies have policies, standards and guidelines (PSG's) that have coercive, normative and mimetic isomorphic effects that can lead to institutionalization of governance practices, which may be an area that lends to the discussion of IT GRC adoption since the impact contributes to the logic behind IT governance and risk management.

In the "Governance and Innovation" section, the authors indicate that democratically structured groups can be more effective than hierarchically structured and autocratically led groups for dealing will ill formed, open ended problems, while hierarchically structured groups are better for dealing with well-formed ones (Hearn & McLendon, 2012). Faculty can be indifferent to campus wide governance issues, unless there is a pressing crisis or threat. Faculty are better in areas of their own self-interest, such as teaching and research in their discipline (Hearn & McLendon, 2012). This discussion is interesting from the perspective of IT GRC adoption, in that faculty would not likely be concerned with such matters (with the exception of those who work in this area), therefore, there could be faculty resistance to changes made

involving IT GRC, especially if changes negatively impact them, or feel bureaucratic in nature. Since IT GRC aligns more with the bureaucratic/rational form of governance, it would seem that we would find it more prevalent in environments where both means and ends have been agreed upon. In conclusion, the authors reference Tierney's (2004) identification of three shortcomings in governance scholarship: 1.) Most is non-empirical 2.) Too little research on non-four year institutions and the governance roles on staff, students and non-tenure line faculty. 3.) Inattention by analysts as to how well the core purpose of institutional governance is being served (Hearn & McLendon, 2012). The authors then mention that they have "largely set aside governances ultimate purposes" pointing to disagreement on goals. The apparent intent of the research is to discuss the literature and trends in governance research, and make suggestions for further study.

"Governance Research"(Hearn & McLendon, 2012) helps set the backdrop well for my research into the impact that organizational theory and institutionalism has on the adoption of IT GRC. It is clear that a myriad of variables related to governance are at play at any given institution at any time. Complexities ranging from the type of governing or consolidated board; The model of governance at the executive leadership level of the institution and administration; institutional values related to democracy and shared governance; the power of the faculty senate; and the overall mission and values of a particular institution can all affect the decisions involved with establishing IT GRC. The information provided in this piece is quite informative as to the current state of overall governance in higher education and the issues involved therein.

As indicated, organizational change theory may be a factor in the adoption of IT GRC. The organizational change theory lens allows us to look at the phenomenon of low IT GRC adoption in higher education from the perspective of change adoption. Armenakis and Bedeian

(1999) review of 1990s literature on organizational change, including updates on existing organizational theories related to change. The study encompasses recent literature on the subject, which takes into account current strategies and leadership styles, which may shed light on GRC adoption issues relevant to organizational change. The research here looked at three themes: content, context and process. The second theme, contextual issues, has the most relevance to governance adoption, as it principally focuses on the forces existing in an organizations environments (Armenakis, 1999). In this theme, the authors reference the Fox-Wolfgramm et al research which indicates that organizations will resist pressures to change if the changes are not consistent with the organizations current identity. The authors also reference the 1997 work by Sastry, which discusses organizational failures to adopt change, "Principal among these is that a change effort is likely to fail if an organization adopts a strategic orientation that does not match the requirements of its external environment" (Armenakis, 1999).

Much has been written regarding how to successfully implement changes in an organization, including the popular work of Kotter (1995), which is taught in many business schools today. Kotter's eight step process is known by many, and other authors have produced similar steps as a result of their research, including Fernandez and Rainey (2006), in their piece on managing change in the public sector. In this work, the authors indicate that managers purposeful actions may drive change, and that "environmental, cognitive, and resource constraints may place limits on such action" (Fernandez & Rainey, 2006). Fernandez and Rainey indicate a very similar eight steps to successful change in the public sector, but point out some key differences, such as the impact of career civil servants as noted by Warwick (1976): "career civil servants, who are allegedly motivated by caution and security, can use the frequent turnover among top political appointees to their advantage by simply resisting new initiatives

until a new administration comes into power." This is an interesting point that could be related to a lack of governance adoption in higher education information technology. The authors also find that change in the public sector often "requires top management support and the cooperation of career civil servants in addition to politically appointed executives". Instability in such an environment could cause difficult or unpopular change attempts to be waited out, where the effort might simply die before it is executed. The impact of the external environment, specifically political overseers, can be instrumental in the rejection or implementation of change. If political overseers convey a vision that supports the change and select appointees that are behind the change, and have the knowledge and skill required to manage and implement it, the change has a better chance of success. The authors also find that sufficient resources are required to implement changes, and that change is "not cheap or without tradeoffs" (Fernandez & Rainey, 2006).

The article "Implementation of IT Infrastructure Library (ITIL) in Australia: Progress and success factors"(Cater-Steel & Tan, 2005), continues the study of ITIL adoption, success factors and benefits in Australia. The most relevant research question and hypothesis to this study is the first: "Is implementation progress of ITIL associated with organizational factors?" (2005). The question's hypothesis is partially supported, and one finding of interest is "Factors identified as most critical to successful ITIL implementation are senior management commitment and an effective ITIL champion" (2005). This is not surprising, as a common practice for implementing change successfully is to have the buy in of management and to establish a champion that is passionate about the change. The strengths in this study are that it specifically focuses on 110 institutions that have adopted ITIL, and used survey as the mechanism for exploring answers to its research questions. Weaknesses include that the study's participants were all attendants of a

conference on ITSM, which may indicate a bias towards governance practices. The study is also isolated to Australia, furthering the case that there is a gap in the research relevant to the U.S., and the question of why is adoption low (Cater-Steel & Tan, 2005).

The research on IT GRC is relatively light, and most of what has been reviewed here pertains to implementation and benefits, as well as comparisons between industry's and countries. The research on the low adoption of IT GRC in U.S. higher education is almost non-existent, indicating a gap in the research and knowledge in this area. More research is needed in the area of GRC adoption in U.S. Higher Education.

The available studies on the subject of GRC practices in IT often include studies of success factors for implementation, but they stop short of collecting information regarding why an institution does not start in the first place. If the value of IT GRC is indeed high, then why would one not implement these best practices? This leads to a number of questions: What are the factors that contribute to a lack of implementation of IT GRC practices in U.S. higher education? Is it a lack of understanding of risk by institutional leadership? A lack of resources in IT departments to dedicate time, or low prioritization of GRC? Are there cultural issues that impact GRC adoption? How does the varied overarching governance structures of individual institutions affect IT GRC adoption? How do institutional CIO's, CISO's and other leaders explain this phenomenon?

The literature reviewed provides a framework of study that leads to a gap in current literature and knowledge. The benefits and challenges of implementing IT GRC practices in international settings across industry are explored through several lenses, but the literature on why IT GRC adoption in U.S. higher education is undiscovered country.

An understanding of why the adoption rate of IT GRC in U.S. higher education lags that of other countries and industries needs to be developed. Building on the literature that exists through research that focuses on U.S. higher education, and using a combination of lens to view the landscape, perhaps the underlying reasons for low adoption can be uncovered. With this knowledge, institutional leaders and Information technology executives and leaders can develop approaches to solve this problem.

The institutional theory lens is a good framework to review the problem. Previous work by Cater-Steel, Tan and Toleman (2009b) and Marrone et.al. (2014) used institutional theory to study ITIL adoption in other environments, leaning on the work of DiMaggio and Powell (1983) and Meyer and Rowan (1977) to conclude that ITIL in particular has become institutionalized in environments where ITIL has been adopted, largely due to three isomorphic pressures: coercive; normative; and memetic. The study further concludes that "ITIL processes have become fashionable and institutionalized; they have travelled through time and space (Cater-Steel et al., 2009). A lack of institutionalization of IT GRC in U.S. Higher Education could be a contributing factor to low adoption.

So, further study as to why adoption of IT GRC in the U.S. is necessary, specifically in higher education. The use of two theoretical lenses, organizational theory and institutionalism, could greatly inform such a study.

CHAPTER 3

DATA AND METHODS

Information Technology Governance, Risk Management and Compliance (IT GRC) practice adoption is low in US higher education relative to other nations and industries, but little research has been done to investigate why. Since the research in this study searches for understanding as to "why" IT GRC adoption is low, qualitative research methods are used. It is clearly the case that IT GRC practices improve efficiency and reduce risk, while helping to ensure compliance with regulators and accrediting bodies, so why do institutions of higher education lag other industries and countries in adoption of these practices? This study seeks to answer the following research questions: How do resource constraints, institution size, and executive buy-in and education regarding GRC contribute to the variation in adoption practices? How do socio-environmental factors, such as institutionalism, impact the decision to adopt GRC practices? And in what ways do organizational change resistance factors, governance structure, or existing IT culture impact the adoption of GRC? In this qualitative study utilizing a basic qualitative approach, informed by organizational change theory and institutional theory.

The primary mode of inquiry for this study was interviews. Once the interviews were completed, the data were checked for validity, and findings presented. The data collected by the two methods were analyzed to determine if the mode of collection impacted it. The researcher was the primary instrument for data collection during the study, and used deductive and inductive constant comparative techniques in the data analysis to attempt to determine explanatory power of theory that explains the lack of IT GRC adoption. Inductive analysis was

used to identify emerging themes. Engagement with experts in the field during interviews enabled development of meaning pertaining to underlying issues that inhibit IT GRC adoption.

Sample Selection

Since this study searched for answers related to why IT GRC adoption is low, I used a purposeful sampling strategy to interview ten Information Technology leaders in higher education in the University System of Georgia (USG) to gain insight that leads to the discovery and understanding of why IT GRC adoption is low. I chose the USG for this research to afford the opportunity for face-to-face interviews because of proximity, familiarity with the system and its institutions, and because of its consolidated governing board design. A consolidated governing board should logically provide for more effective standardization and consistency across its member institutions by design. Since previous research by Marrone et al. (2014) indicates that size may be a factor in governance adoption, mid-size institutions were examined. There are 29 institutions of varying size in the system, so my goal was to conduct interviews at institutions with 10,000 to 20,000 student FTE, which are primarily classified as comprehensive institutions. Recently consolidated institutions were excluded from the study, as their increase in size and scope may have governance outcomes that are yet to be determined. The goal was achieved except for the fact that two institutions were not classified as comprehensive. These exceptions proved to be beneficial to the research, as the resultant variance added additional perspective and richness to the data collected.

Since this research searched for the answers as to why IT GRC adoption is low, purposeful sampling was used to select the interviewees. According to Merriam and Tisdell (2016), purposeful sampling should be used when the research wants to "discover, understand,

and gain insight and therefore must select a sample from which the most can be learned." Five of these leaders were Chief Information Officers, as their considerable expertise and knowledge in the area of IT governance should provide excellent insight into IT GRC adoption. In addition to the ten IT leaders, I interviewed five non-IT leaders at each institution, one former University System Office leader, and one university president. The goal was to interview one CIO, one IT staff member, and one non-IT executive from each of the selected institutions. This goal was achieved, but with the addition of one former USG leader added to obtain additional perspective. Also, two institutions were not classified as comprehensive, which I discuss further in chapter 4. The type of purposeful sampling utilized is unique, since the interviewees are CIO's, directors, or staff members of information technology in higher education. The leaders hold the position of Chief Information Officer or equivalent with at least ten years' experience in higher education information technology, and have at least three years in their current role with two exceptions; both have ten years' experience, but have been in their current position less than three years. The perspective provided by the latter provided additional context to my research. The staff members had at least 2 years of experience in higher education information technology to ensure they are knowledgeable enough regarding IT governance. With 10 years of exposure to higher education information technology, the IT leaders have been exposed to a variety of governance and risk management frameworks, and should know the regulations that must be complied with, as well as the threats posed to information security today. Additionally, I interviewed six higher education leaders from outside of IT to obtain their perspective on IT governance and gauge the importance and urgency that they assign to the matter. One interviewee was a university president who provided rich context to my research from a high-level perspective, and one interviewee was a former USG leader who provided a different perspective on IT governance. In

order to allow the interviewees to be candid in their responses, and since the subject matter is governance, which may include discussion of compliance related issues, I determined that the interviews should be anonymous and confidential. Based on the sampling strategy, I ultimately interviewed 16 higher education leaders: five CIO's, five IT staff, and six non-IT leaders. After these interviews, I reached saturation as the issues and themes discovered in interviews became consistent with few new issues raised. The data collected was analyzed concurrently with collection to the maximum extent possible in an effort to know when saturation of information occurs and to ensure the freshness of information.

Data Collection

The interviews conducted were a combination of in-person and phone conference interviews using qualitative interview techniques. All interviews were recorded using a digital voice recorder, and the data was transcribed and analyzed after each interview. The questions were open-ended and semi-structured, allowing for rich discussion and exploration based on the interviewees world view and emerging information (Merriam & Tisdell, 2015). The interview protocol used to guide the interview process is attached (Appendix A). Participants in the study were selected from five midsize (10-20K) institutions based on availability of interviewees. The interviews were conducted onsite at each institution to minimize the impact on the interviewee with the exception of one, which had to be conducted by phone. The interviews were transcribed and then analyzed as soon as possible after completion of the interview. The interviews varied in length from forty five minutes to nearly two hours. This variance is primarily due to the resultant conversations that followed the questions. With the CIO's this was evident in that they tended to expand significantly on discussion items that they were passionate about, or where the topic covered an area that they had or were currently addressing. The other

IT staff were similar to the CIO's in this respect, but their commentary was usually not as long. The exception here was with the CISO's interviewed, in that they often had much commentary related to information security, compliance, and risk management. The non-IT staff interviews varied in length as well, but this was often as a result of tangential discussions on areas they were curious about related to IT operations.

Data Analysis

After the data were transcribed for each interview, the data analysis process was conducted. The data collected consists of the transcribed interview data collected during the face to face and phone interview process, and all field notes and documents collected during the interviews. Data were analyzed after each set of interviews, utilizing a deductive and inductive constant-comparative analysis strategy. This technique required that the results of interviews be interpreted and analyzed as soon as possible after the interviews were conducted. Interview data is fragile and time sensitive, and therefore gets more difficult to reconstruct as time goes by(Merriam & Tisdell, 2015). Each interview was recorded and transcribed, and field notes were taken to exercise the constant comparative method. Emerging insights and hunches guided further development and modification of the interview questions; these insights and other thematic developments were captured in analytical memos associated with each transcript as necessary. After each subsequent interview, the analyses were compared collectively to note trends in theme or emerging patterns of theory development, and the process was refined along the way. The CAQDAS software used for this research was a product called NVIVO, which allowed for coding and analysis of the interviews. The tool allowed for manual classification and coding of documents, code analysis, and included color codes for separation, codebook creation, and the import of a variety of file types. The coding retrieval and coding sequences

tools allowed for text segment association and identification of coding occurrences. The transcripts were coded for themes, categories, and findings that offered answers or insight into the research questions through the theoretical lenses of institutional and organizational theory. The transcripts were first open-coded, then axially coded to condense the codes into themes that captured recurring patterns. Selective coding was then used to aid in the development of hypotheses. A master list of axial codes and themes collected from all interviews was maintained in the software. This list was continually refined, and contains the identification of the interviewee and the line numbers associated with the code for easy data retrieval. The analytical memos and other notes were associated to each interview in the software for data management purposes. All data collected were backed up locally and to MS Office 365's cloud storage to minimize the possibility of data loss.

After open coding, the approach shifted from deductive to inductive reasoning to aid in theme development, and answers to the research questions began to develop. As the categories were refined through the constant comparative method, they were checked to make sure they are exhaustive, mutually exclusive, sensitive and conceptually congruent. During the interviews, key words and phrases that pointed to the three isomorphic pressures were noted, and the interview transcripts were coded where the language indicated the presence of possible isomorphism. These codes were inductively rolled-up into categories that reflected possible answers to research question two.

Though often associated with grounded theory research, the constant comparative method has proven to be beneficial in other types of qualitative research, as indicated by Charmaz (2014), and Fram (2013). According to Sheila Fram "I continue to espouse the use of CCA at the early stages of a research project to identify patterns in the data and to organize large amounts of data

so as to abstract categories"(Fram, 2013). At saturation, the interviews concluded, and theorization of the categories began. Categories were linked where appropriate and specific properties and finding were associated to each, resulting in answers to the research questions and development of substantive theory. Using the Capability Maturity Model Index (CMMI) levels as a guide, the governance maturity level for each institution was estimated inductively to provide a general assessment of the maturity levels based on the interview responses.

Validity and Reliability

This study was limited by the sample size, location of sample, and methods used. Sampling a larger number of IT leaders across all Carnegie classifications and across the U.S. would improve the quality of the data collected, and an explanatory, sequential mixed methods approach would allow the opportunity to use quantitative data to inform the qualitative interview questions or case study design.

To ensure the validity of the study, triangulation was used, in that the interview data collected came from multiple sources at different times and locations. This data was cross checked to ensure its validity. Furthermore, member checks were performed to ensure the investigators interpretations are correct in the minds of the interviewees. The member checks were conducted by providing the findings to a subset of the interviewees to gather feedback. Finally, a peer review was conducted by another IT leader in the state university system.

To ensure the reliability of the study, an audit trail was established through the use of a research journal as an audit log. In this journal, the dates, times and locations of interviews were recorded. The journal also contains descriptions of how the data is collected, how categories are

derived, and how decisions were made along the way. The journal will be a running record of the investigators interaction with the data collected.

Finally, transferability was maintained by the use of rich, thick descriptions by the investigator, which should allow the reader to determine the extent to which their situation matches that of the study. Maximum variation was used in sample selection to include a diverse group of CIO's and other executives across institutions of various type and size, in state and out of state, and by using face to face as well as phone interviews.

Researcher Bias and Assumptions

As a previous Chief Information Officer and current Deputy Chief Information Officer at an institution of higher education with 15 years' experience in the field, and more than 34 years' experience working in high technology fields with varying degrees of compliance and security implications, I understand the value of governance and process regarding normal and routine operations. I am systems minded, in that I see most repeatable tasks as something to be systemized and documented to improve efficiency and reduce risk to the environment. With this background, one could surmise that I am biased in favor of approaches that lead to the proper creation and implementation of IT GRC in higher education. I have, and continue to push for implementation of these practices at my own institution where appropriate. Guided by my desire to find the truth, and using the techniques listed for validity and trustworthiness, I will ensure my biases do not affect this research.

CHAPTER 4

FINDINGS

The findings from the research attempt to answer the central research questions: How do resource constraints, institution size, or executive buy-in and education regarding GRC contribute to the variation in adoption practices? How do socio-environmental factors, such as institutionalism, affect the decision to adopt GRC practices? In what ways do organizational change resistance factors, governance structure, or existing IT culture impact the adoption of GRC? Do resource constraints, institution size or executive buy-in and education regarding GRC contribute to the variation in adoption practices? In sum, the findings partially answer the research question as described below.

The research data collected comes from interviews conducted at five mid-size (10,000 to 20,000 student FTE) institutions in the University System of Georgia. The institutions and names of staff members interviewed are kept anonymous, and are therefore named Institution A-E, with staff titles used instead of names. The institutions have various mission types and are geographically dispersed throughout the state. During the interviews, I asked the interviewees to access the maturity level of their governance on a scale of 0-5 using the Capability Maturity Model Index (CMMI) as a reference. The CMMI is an index original designed to access the maturity of software ("https://www.sei.cmu.edu/reports/93tr024.pdf," n.d.). CMMI has been used as a model to gage maturity of IT processes and governance as well. The description of the characteristics of each institution follows the system office description below.

The University System of Georgia and Information Technology Services

The University System of Georgia (USG) is comprised of 28 colleges and universities across the state. The USG's Board of Regents is a consolidated governing board that operates as a legal governing and managing authority over the 28 higher education institutions including 4 research universities, 4 comprehensive universities, 10 state universities and 10 state colleges. The USG maintains a policy manual that "Sets forth essential procedural components USG institutions must follow to meet Board of Regents policy mandates and the statutory or regulatory requirements of the state of Georgia and the federal government; provides new financial, business and human resources professionals in the USG the necessary information and tools to perform effectively" ("University System of Georgia | University System of Georgia," n.d.). The USG's Office of Information Technology Services (ITS) is the system's IT central office, and is structurally under the division of Strategy and Fiscal Affairs. The ITS office "delivers comprehensive, mission-critical technology resources, services, insights, and solutions to students, faculty, and staff; the Board of Regents; the University System Office; the Georgia Public Library System; and Georgia residents" ("Information Technology Services | University System of Georgia," n.d.). Under the Board of Regents Policy Manual, ITS provides a comprehensive IT handbook that contains the policies, standards and guidelines (PSG's) which partially guide the member institutions in the areas of governance, compliance, and risk management. The Office of ITS provides a shared governance advisory committee that consists of the CIO's or directors of IT at the member institutions. Known as the Chief Information Officer Advisory committee (CIOAC), this committee advises and collaborates with the USG CIO in the interest of the Board of Regents and the member institutions. The Office of ITS also

provides numerous centralized services for the member institutions ("Information Technology Services | University System of Georgia," n.d.).

Institution Profiles

Institution A is a public, comprehensive, four- year doctoral degree granting institution that has an established central IT division with the CIO reporting to the president. The institution has some IT governance in place, mostly in the form of shared governance committees. The institution's IT division has a number of other governance components related to work intake, project management, and information security. The IT division's governance as it relates to the Information Technology Infrastructure Library (ITIL) and Control Objectives for Information and related Technologies (COBIT) is likely between a 1 and 2 on a capability maturity scale (CMMI) of 0-5. Incident, change, and project management are in place and at varying stages of maturity. The CIO and CISO both feel that the current expansion of the institution is going to require more structured governance, and that institutional size is a factor in adopting standards of practice, such as ITIL.

Institution B is a public, four-year, baccalaureate degree granting institution with a shorter history than the others studied. The CIO previously reported to the president, but now reports to the vice president for business and finance. The institution's IT department has some governance components in place, and the leadership is looking to both expand and improve its current governance practices. The CIO indicated that some governance practices exist, and that the he is currently waiting the approval of executive leadership on a program that has multiple governance projects associated with it. The department has an estimated governance maturity level between 0-2 using a CMMI scale.

Institution C is a public, comprehensive, doctoral granting institution that has a well-established IT department with a VP/CIO that reports to the cabinet. The president of institution C is a firm believer in good IT governance and believes in transparency, good communication, and proper project management. The president believes he has a good understanding of how to influence change in his institution and it is evident that he is passionate about enabling change. The institution has a new VP/CIO of IT that sees the value of governance of IT, project, and risk management. Since coming onboard, she has established a shared governance steering committee and remains an influential member. The Deputy Chief Information Officer (DCIO) sees the value of IT governance as well. She is a longtime advocate of GRC practices, but culture and change resistance have been impactful in her ability to complete change. The former culture at the institution and in IT was institutionalized, with a "make do - spend as little as possible on IT" philosophy. Isomorphism is a factor in that there is little evidence of isomorphic pressure other than coercive pressure applied by the USG IT handbook and mimetic pressure applied by some best practice success at other institutions (processes). The department has an estimated governance maturity level between 1 and 2 using a CMMI scale.

Institution D is a public, four-year, doctoral granting comprehensive institution. The CIO reports to the president of the institution and is on the cabinet. The CIO firmly believes that a key to establishing good IT governance is executive buy-in and communication with the cabinet. IT governance at institution D is at an early stage in development, but plans are coming together to establish more robust governance of information technology. An issue in the past has been excessive turnover at the institution's executive leadership level, but there seems to be indications that stability is taking place. The Chief Technology Officer at the institution has been employed there for a considerable period, albeit in other roles. Since moving to his new role, he

has taken steps to implement project management, and procurement and communication processes. The CTO is a believer in service owner buy-in to processes and procedures. The third interviewee, the institutions risk manager, partners with IT on processes or concerns related to risk, such as Payment Card Industry Standards (PCI) compliance. She strongly believes that good governance practices mitigate risk. She also believes that resource constraints are a cop out, because proper prioritization should remove the constraints. The IT department at institution D has an estimated governance maturity level between 0-2 using a CMMI scale.

Institution E is a public, multi-campus, four-year, master's degree granting state university that also has some doctoral programs. The institution has a well-developed IT division, and the CIO reports to the VP of Business and Finance. The CIO has worked in IT in the USG at a single institution for twenty-seven years, and has a great deal of knowledge regarding the history of IT GRC. The CISO at the institution has five years in higher education, but has significant education and experience in information security and governance. The IT division has established a number of governance components, including some shared governance committees and a significant number of programs, processes, and functions that are based on best practices from ITIL, COBIT and NIST. The institution uses a maturity model approach to continually improve upon these processes, and most are self-evaluated as between 2-3 on a CMMI 0-5 scale.

Similarities and Differences Between Institutions

All of the institutions are public, four–year, baccalaureate or higher granting institutions in the University System of Georgia. The institutions range in student body size from approximately 11k to 20k FTE students. While all of the institutions award bachelor's degrees, most award masters degrees as well, and some award doctoral degrees. None of these

institutions are considered to be research institutions, although there is a research component at all but one. All but one of the colleges have a residential component, which does affect the IT services provided. The institutions studied have a number of similarities related to governance in the following areas: governance maturity, USG IT Handbook, and project management. While governance maturity varied by institution in level, type, and process, all shared an affinity for shared governance committees, project management and incident management. All of the institutions were well aware of the USG IT handbook, especially in the areas that require compliance. The USG handbook references provided the primary institutionalization factor uncovered in the research; isomorphic coercive pressure. Project management was the single governance function that resounded the most with the interviewees, as all see the value of managing projects to ensure their success, and ensure that they can demonstrate that they are good stewards of university resources. Incident management seemed to be second in process maturity, in that all institutions interviewed practiced it in some form. The primary reasons mentioned for incident management tracking were that the size of the institutions and volume of incidents required management of the process involved, and that tracking incidents allowed the departments manage the process and show that they were good stewards of resources.

The differences in the institutions interviewed were many, and those differences relative to IT governance often reflected such. At a high level, the stability, IT governance knowledge, and leadership style of the executive administration was a significant factor in the governance type, breadth, and maturity at the various institutions. The priorities of the institutions and those of the IT leaders were notable and impactful on the type of governance structure in place as well as current initiatives to improve or expand IT GRC. While the institutions showed some maturity of their processes, governance documentation and shared governance committees, there

was much variance in the frameworks and styles. While some of this variance is to be expected based on the differences and level of autonomy granted to institutions in the USG system, it is interesting that there was little standardization of frameworks, given that the USG is a consolidated governing board, with policies, standards and guidelines (PSG's) in place that provide the opportunity for standardization. This lack of standardization is an indication that the institutions may be at odds with the governing board, or that the maturity of processes simply has not developed yet. Furthermore, the USG Office of Information Technology Services provides a handbook that has been developed with the input of institutional CIO's ("Information Technology Services | University System of Georgia," n.d.). This handbook enables much of the standardization of function, process, and procedure necessary to gain efficiency, ensure compliance, and reduce risk. If maturity of process development is the issue, then prioritization and buy in to the USG IT handbook may be a concern.

Impact of Organizational Change Factors Contributing to Low Adoption of IT GRC

Leadership and Prioritization

A central theme that developed in my study was the impact of leadership, which includes consideration of prioritization, the importance of leadership buy in, and executive understanding regarding the importance of IT Governance, Risk Management and Compliance practices in higher education. In the literature reviewed for this study, specifically that of Pollard and Cater-Steele (2009) and Iden and Eikebrokke (2014), it was clear that a number of organizational and change related factors contribute to the adoption of IT GRC. Two important contributing factors are leadership buy-in and prioritization, which are components of research question one. The findings in this study indicate the importance of leadership buy-in and prioritization in

relationship to the adoption of IT GRC, specifically in the responses to question five, part two, on leadership buy-in, which ranked second in importance to question five, part five on prioritization. Table 4 shows the scores and averages from research question 5.

Interestingly, the "other" IT and non-IT interviewees ranked executive buy-in as the number one factor affecting IT GRC adoption, while the CIO's ranked it second, behind prioritization. Clearly, these two factors go together, as high priority initiatives at the executive level would need leadership buy-in in order to be executed effectively. One member interviewed was a university president, and he indicated very clearly that executive prioritization of the change initiative was the most important factor, followed by leadership buy in As mentioned, a central theme that developed in my study was the impact of leadership, which includes consideration of prioritization, the importance of leadership buy in, and executive understanding. In this leadership theme, the data coding indicated the strong impact of leadership buy-in, seemingly stronger than was indicated by the answers to question five. Leadership buy-in was both directly and indirectly indicated as significantly impactful on IT GRC adoption by the interviewees twenty-seven times in the interviews, while prioritization and executive understanding was indicated seventeen times. Interestingly, the institutions where the CIO was on the president's cabinet were more successful at implementing governance structures, especially shared governance committees. The president interviewed in the study seemed to intuitively understand the need to have the CIO on the cabinet to help establish the understanding, buy-in and prioritization of some IT GRC practices. This president's Deputy CIO reinforced his intuition by stating,

> So having his (the president's) buy-in this go-round was absolutely one of the highest success factors. [to]Have him speak to the vice presidents and the

> president's Advisory Council which are the AVP's and Dean's and the associate Dean's and having him allow the CIO to speak and talk about the importance of it. So really without that buy-in I don't know how… I don't know how you could be successful.

Similarly, another CIO interview provided the following information while discussing background on his institution:

> "We are only 11 to 12 years old. 12,000 students. It's [governance] never really been at the forefront from my perspective a priority. Now, it's a priority because, in a sense, we're no longer ramping up enrollment. We have to maintain enrollment. The structure that IT Governance provides adds value in which we have to use to be good stewards of taxpayer dollars".

This is an indication of shifting priorities in favor of governance to gain the efficiencies that previous research determined come along with it (Bhattacharjya & Chang, 2006; Cater-Steel, Toleman, & Tan, 2006; Gacenga et al., 2010). The CIO recognizes that as their growth stabilizes and with the current size of the institution, governance needs to be prioritized, built, and implemented in order for IT to be effective and not seen as a costly area that cannot show the value it adds.

Communications

Communication plays an important role when making changes to governance, and can be helpful for ensuring prioritization of change initiatives. Most of the interviewees stressed the importance of effective communication, and each of the CIO's elaborated on communications to some degree. The institution A CIO talked about the importance of prioritizing IT GRC, and specifically about the role communication plays in establishing the priority. His use of the word priority was not numerical, but instead more about establishing importance and urgency. The mechanism he used for communicating the need for governance was via the formation of shared governance committees. In these committees, the CIO feels he is better able to communicate the changes necessary for establishing IT GRC. Therefore, the institution A CIO establishes priority through shared governance committees where relationships with people can be built and buy-in obtained. Some of these committees at institution A have executive leaders, and some have lower level leaders involved, allowing for a broad base of communications regarding IT governance and other initiatives. The institution B and D CIO's talked at length about the importance of communications, especially in the area of communications with the president and senior staff. The logical indication here is that leadership buy-in, executive understanding, and prioritization are directly connected, and that executive understanding of the value and importance of IT GRC must be established, which leads to buy-in, which then leads to effective prioritization, all of which must be properly communicated to be effective.

Resource Constraints

The impact of resource constraints are also a component of research question one. While it may seem obvious that inadequate resources will put any project at risk of failure, governance project resources may be underestimated, in that they often require training of leaders and staff as well as more financial and personnel resources than expected. Higher education IT units are not always staffed with people that have the necessary skills or time to build such governance. Pollard and Cater-Steel (2009) considered dedicated resources to be a critical success factor in the implementation of governance changes, and that a lack of resources provided by senior management (either funding or people) to implement governance changes would cause the project to fail, and be difficult to resurrect. Iden & Eikebrokk (2014) found that adequate organizational resources, specifically in the area of trained staff, was an important factor in governance adoption, specifically ITIL. One CIO interviewed stated "IT resource constraints would be the largest factor that impacts the development of [governance] documentation". It may be that higher education IT units lack GRC trained personnel, and that the lack of leadership buy in or prioritization of governance leads to inadequate funding to obtain the necessary personnel resources to implement IT GRC practices. The interview data in this study supports this conclusion as evidenced by the answers to interview question five, part one. The CIO's interviewed scored resource constraints as a significant factor in the lack of IT GRC adoption, below leadership buy-in and prioritization. The "other" IT staff interviewed scored resource constraints below leadership buy-in, but above prioritization. Since these "other" IT staff are likely to be involved in or closer to the implementation of IT GRC, this scoring is likely an indicator that they feel resource constrained due either to a lack of training or a lack of time to do the work necessary. The non –IT interviewees were rather split on the answer, as some scored

resource constraints at the highest or second highest possible score. The reasons for this variance centered on logic, with an Institution D contributor reasoning that with the right prioritization for the establishment of GRC, resource constraints should not be an issue. The president interviewed felt that adequate resources were very important, and that the decision he had to make often was between providing more resources to the faculty or more to IT. Obviously, both are important and the mission of higher education is educating students, so faculty arguments may tend to win in such decisions if the understanding of IT governance needs are low. This indicates the need for executive understanding of the importance of IT GRC, which may then elevate its priority and potentially enables the funding of the necessary resources for IT GRC initiatives to be successful.

Institutional Size

The results were mixed regarding the effect institution size has on the establishment of IT governance. A majority of interviewees considered size to be a factor on the type of governance needed, but the majority also believed that certain governance components need to be in place regardless of institution size, specifically those related to information security. The Chief Information Security Officer at Institution A stated: “I think that – yeah. I think size does matter. I think what happens is, the smaller schools can get by without it because it's a small school, IT can do it or the small school can pretty much work with that, because you've got enough people to know everybody involved and they know what they're doing and all that kind of stuff. Now, if you get bigger, especially in a school where 27,000, 28,000, whatever, that to me is too much. You can't do it. You got to have some way to govern it”. This theme continued throughout the interviews, often indirectly in discussion of governance in general. When discussing governance with the CIO of Institution A, it seemed that much of the process related governance had grown

organically, and that the real governance structure revolved around the shared governance committees, but that with the multi-campus growth his institution is experiencing, more structured process governance was going to be necessary. One CIO stated the following when discussing growth from a relatively small size institution to a much larger one:

> When you are small, you can sit everybody down in one room and just hash things over, the need for these additional [governance] structures that hold things together and to contain the information seems unnecessary … I guess that's another piece that when you can sit down and talk about everything and you get everybody on the same page and deal with issues and patch through things and everybody in the room is in the know and on the same page in moving forward, at a larger institution, that isn't sort of incredibly efficient. Scaling up on size will certainly break that.

Inductively, the size of the institution does matter regarding the type and scope of IT governance, but size is not important regarding matters of governance that pertain to governance and risk management. This is supported by Marrone et al in their (2014) study on the impact of size on ITIL adoption, which hypothesized that adoption of ITIL processes varied by institution size, and the hypothesis was partially supported due to a significant difference in adoption between large and very large institutions in the U.K., indicating that more research was necessary relative to size. Based on the research in the literature and on the information induced in this study, size does seem to matter relative to adoption of IT governance processes relative to scope and number, but not relative to security and compliance governance (Marrone et al., 2014).

Throughout the interview data analysis it was clear that resource constraints, institution size, and executive buy-in and education regarding GRC contribute to the variation in adoption

practices; Thus, RQ1 is supported. Additionally, the importance of prioritization of IT GRC was determined to be a significant factor, and the importance of institutional size was determined to be relative to type and scope, with security and risk management governance being applicable regardless of size, and process governance being more relevant in larger institutions.

Organization Theory and Institutionalism – The Impact of Isomorphic Pressures on Adoption of IT GRC

The effects of isomorphism on the institutionalization of work process are well known. The landmark study conducted by DiMaggio and Powell (1983) is one of the most cited and famous in the area of the effect of isomorphic pressures and the institutionalization of workplace behaviors related to work process. According to DiMaggio and Powell, "In Hawley's (1968) description, isomorphism is a constraining process that forces one unit in a population to resemble other units that face the same set of environmental conditions" (DiMaggio & Powell, 1983). There are two forms of isomorphism, competitive and institutional, the latter of which relates most specifically to this study and contains the three isomorphic forces: coercive, normative, and mimetic. DiMaggio and Powell contend that these forces are the mechanisms that cause institutional isomorphic change to occur. IT GRC practices are continually evolving, and require organizations to change. In order to determine the answer to research question two, this study evaluated the impact that the three isomorphic forces have on governance adoption at the institutions interviewed. During the interviews, I asked about the impact of isomorphism directly, but most of the information collected arose inductively from the discussions in general.

One study, conducted by Cater-Steel, Tan and Toleman (2009b), was relevant to this area of research. The study referenced the work of DiMaggio and Powell (1983), Meyer and Rowan (1977), and others in the quest to prove the ITIL had become institutionalized. The paper further

proposes, “that the widespread adoption of ITIL by service providers has resulted in homogeneity of ITSM processes”. The study concluded that the three isomorphic forces caused institutionalization of ITIL and that “Using institutional theory as a lens, the analysis at both field and organisation level supports the view that ITIL processes have become fashionable and institutionalised; they have travelled through time and space” (2009b).

The environment studied by Cater-Steel, Tan, and Toleman had experienced ITIL adoption, but the data was collected at a high level and not specific to higher education in the United States. The higher education institutions in this study have not institutionalized ITIL nor other standardized governance processes or frameworks. Only Institution E has a significant adoption of ITIL, with Institution C working towards adoption.

In interview question five, I probed towards isomorphic forces, specifically in the areas of what peers were doing (mimetic), compliance requirements (coercive), and industry standards of practice (normative). The most prevalent of the three forces was coercive, as was indicated by the numerous mentions of the USG IT Handbook, PCI compliance, and other regulations. The least prevalent of the forces was mimetic, which is logical in that only one of the institutions seemed to be looking at others to help establish governance. Normative pressure was only slightly more noticeable, in that each institution had at least one member that discussed industry practices, the most notable of which related to project, incident and change management, followed by the security practices referenced in NIST.

As mentioned above, coercive pressures were the most prevalent of the three isomorphic pressures indicated in this study. The coercive forces that were apparent from the interviews related primarily to the USG IT Handbook, audit requirements, federal regulations, and PCI

compliance. During the interviews, compliance was mentioned seventy times; audit was mentioned twenty-three times; and the IT Handbook was mentioned twenty-two times; and nearly always in the coercive sense. Coercive forces can be powerful, but are not always lasting. Organizations often create governance documentation and processes in response to some coercive activity, but without continuous pressure, this governance may decay until the next coercion. The Institution E CISO affirmed this during the interview, when he indicated that with coercive pressure, "people are going to do what they are told to keep their job, but may fall back to their old ways if the pressure to do things a certain way is not maintained". So coercion in the form of regulation or documented best practice does not win the person over to a new way of doing things, but only to comply with the coercive pressure while it exists, and then return to the normal or comfortable way of doing things once the coercive pressure is removed. Unless coercive pressure is continuously applied, permanent change is unlikely to occur, so additional pressures are needed. As indicated by Dimaggio and Powell, coercive pressures occur when an organization is dependent on another organization, especially when resources are centralized (Dimaggio & Powell, 1983). In the University System of Georgia, the Board of Regents and the system office provide this resource dependency, and provide most of the coercive pressure felt by its institutions.

In this study, all institutions interviewed are tenants of the University System of Georgia. The Information Technology Services unit at USG does manage centralized IT services for the USG and its institutions, and the ITS unit is developing governance in alignment with its handbook. The ITS unit is not directly authoritative over the institutional IT offices, but collaborates with them in a reciprocal advising role. These factors may indicate an area where there is a weakness in coercive pressure, as institutions in the USG are only partially affected by

the two coercive hypotheses by Dimaggio and Powell. It may be that without continuous application of coercive pressure from authoritative sources, another force is needed, such as mimetic or normative pressure, in order to institutionalize IT GRC practices in U.S. higher education.

Perhaps the most significant finding in this study relates to the lack of normative pressure. The absence of normative pressure found during this research may come from a lack of professionalization of IT GRC in areas other than information security. Keywords coded relative to professionalization, such as formal training, standards of practice, and professional development occurred fifty times in the interviews, and most often in a negative sense, indicating a lack of formal training and professional development around non-technical standards of practice. IT GRC training may often come at the expense of more technical training, which is often relished by IT staff. DiMaggio and Powell (1983) state that it is through formal education that new models diffuse rapidly. This is not the case with ITIL as it is only very recently that university courses have included ITSM concepts (Cater-Steel &Toleman, 2007). The lack of formal education in IT GRC practices in IT-related ungraduate programs, such as computer science and information systems, is likely a key component in the lack of adoption of IT GRC in the United States. The lack of formal education through inclusion of IT GRC classes in undergraduate programs is likely to be more impactful on higher education institutions in that many of these institutions lack the budget to train IT staff in areas other than those required to ensure the technical skills necessary to do their job. If students in undergraduate programs were properly trained in the implementation and use of IT GRC practices, as well as the value the practices provide, the adoption of these practices would likely increase and become more easily institutionalized. Few of the institutions interviewed indicated formal training on governance

practices such as ITIL and COBIT, and slightly higher number indicated formal training in the area of information security. In each of the cases where governance related training occurred, there was evidence that more professional practice existed, and therefore more normative pressure applied, leading to more IT GRC practice establishment and maturity. Relative to normative pressures, Dimaggio and Powell hypothesize that "The greater the reliance on academic credentials in choosing managerial and staff personnel, the greater the extent to which an organization will become like other organizations in its field." And "The greater the participation of organizational managers in trade and professional associations, the more likely the organization will be, or will become, like other organizations in its field" (Dimaggio & Powell, 1983). These hypotheses are partially supported by this study's interview data in that normative pressures exist at the institutions that are providing training and other professional development opportunities to IT staff. The USG Board of Regents can increase the adoption of IT GRC by improving normative pressure by recommending and funding training in the areas that lead to professionalization, such as ITIL and COBIT. Encouragement to attend professional conferences related to It GRC at the national level can also aid in increasing professionalism of practice.

Another factor that contributes to normative isomorphism is IT hiring practices. According to Cater-Steele, Tan and Toleman, "Normative isomorphism also occurs when personnel are filtered by hiring individuals from firms within the same industry and specifying skills for particular jobs. A search of the recruiting site seek.com.au revealed 715 positions in Australia in July 2009 specifically requesting ITIL skills or knowledge (Seek Ltd, 2009). In Australia, ITIL has become a recruiting filter for positions in IT service management" (2009b). There was only one institution interviewed for this research that indicated listing ITIL or other IT

GRC practices as part of their hiring criteria, which may be another reason for low relative normative isomorphism at the institutions studied. Adding IT GRC related language, and certifications such as ITIL and COBIT to job descriptions will help increase normative pressures to adopt IT GRC. These normative pressure increases coupled with coercive pressures, will increase the adoption rates of IT GRC.

Based on the interview data, mimetic pressures were virtually non-existent at the institutions, with two exceptions. The first exception being in regard to information security, as there were numerous mentions of practices at other institutions security programs, and of the USG ITS collaboration and work group on information security. The second being that one institution was following the practices of another regarding ITIL process implementation. Mimetic pressure is likely to be low throughout higher education due to the great variance in governance types and institutional priorities across institutions. The work of Hearn and McLendon in their study 2012 study titled "Governance Research: From Adolescence to Maturity" sheds light on a variety of reasons that this may be the case, and in fact, the title says it all; The research on higher education governance itself is still maturing as the practices themselves mature. Hearn and McLendon indicate that "value assertions" regarding what is best rather than "empirical, social-scientific investigation" lead governance practices, and that research in this area is relatively new (2012). This may be a factor in the low adoption of IT GRC, and the lack of research in such in U.S. higher education. Higher education governance is beginning to look more "corporate" at many institutions, where an emphasis on strategic planning and market conditions influence decisions and governance in general. Higher Education governance is impacted by a variety of factors, and varies a great deal in its maturity. At those institutions that have a strong and authoritative faculty governance component, shared

governance, loose coupling, and application of garbage can theory contribute to the variance in governance structure, type of governance, and prioritization of the implementation of regulatory concerns. Complexities ranging from the type of governing or consolidated board; the model of governance at the executive leadership level of the institution and administration; institutional values related to democracy and shared governance; the power of the faculty senate; and the overall mission and values of a particular institution can all affect the decisions involved with establishing IT GRC. The "organized anarchy" of environments that adopt or maintain such models runs in stark contrast to the standardized and structured governance typically required for IT GRC practices (2012). With all of this variance in governance, it is easy to see why mimetic forces are not prevalent; given so many choices and so little guidance, who would one mimic?

While many larger institutions have perhaps adapted to administrative governance practices that are more bureaucratic in nature due to necessity from scale of operations, smaller institutions that have grown in size and organically grown in governance and structure may hit a point where size demands that governance structure change in order to be efficient and benefit from economies of scale. Each of the institutions interviewed have experienced such growth, and it was clear that institution A's IT unit uses a shared governance model that is heavy on faculty influence. Institution C experienced low prioritization of IT infrastructure and governance initiatives due to the relatively high prioritization of academic priorities. Further points related to faculty and governance are indicated by Hearn and McLendon in the discussion of governance and innovation. The authors indicate that open-ended problems may be more effectively addresses by a democratically structured group, and that hierarchically structured groups may better address well-formed problems, such as is often found in administrative units. IT GRC practices are designed to address well-formed issues, so shared governance models with faculty

influence may not be appropriate for the establishment of IT GRC. Hearn and McLendon also indicate that the most significant governance activity on campuses often occur at the unit level, but that the lack of systemic research at this level should be addressed. Since IT is a nonacademic unit that requires significant governance activity, but lacks systemic, empirical research in that area, the same logic applies.

In conclusion, some governance practices, specifically in information security, and to a lesser degree ITSM, are becoming institutionalized through the varied application of isomorphic forces. These isomorphic forces are lacking for a variety of reasons, the most significant of which may be the varied state of higher education governance overall, which may be so varied due to the low level of empirical research and resultant finding and recommendations done in the area. Low professionalization of IT GRC practices outside of those found in information security contributes to the lack of normalization pressures. In the cases where multiple pressures exist, IT GRC implementation is greater than at those institutions where fewer pressures are applied. In order for IT GRC adoption to increase in the USG, additional isomorphic pressures must be applied.

CHAPTER 5

CONCLUSION

In this chapter, I summarize the findings in relation to the previous research reviewed in the literature review; make recommendations for practice and policy changes based on the findings; and discuss implications for future research. At the end of the chapter, I provide a conclusion where I summarize the information from these sections. The research questions for this study were: (RQ1) How do resource constraints, institution size, and executive buy-in and education regarding GRC contribute to the variation in adoption practices? And (RQ2) How do socio-environmental factors, such as institutionalism, impact the decision to adopt GRC practices? In what ways do organizational change resistance factors, governance structure, or existing IT culture impact the adoption of GRC?

Summary of Findings

Understanding the reasons that adoption of GRC is low in U.S. higher education relative to other nations will help IT leaders and university administrators develop methods to implement IT GRC, and help advise their decision-making process regarding consultation or in-house attempts to implement these important processes and policies. This study focused on five mid-size public institutions of higher education in in the state of Georgia, which may or may not be indicative of the adoption of IT GRC across higher education institutions in the U.S.. The research questions were targeted at IT GRC adoption and maturity, using ITIL adoption as a benchmark, but taking all evidence of IT GRC adoption into consideration. The previous

research by Cater-Steele, Tan and Toleman (2009b), leaning on the research on isomorphism by Dimaggio and Powell (1983), confirmed that ITIL had become institutionalized in industry at the organization and field level, that "ITIL processes have become fashionable and institutionalised; they have travelled through time and space". Sources indicate that in the U.S. higher education industry, this may not be the case yet. Recent research from HDI indicates that approximately 58% of higher education institutions have adopted ITIL as a framework for operational governance ("Q22017-trend-report-highered-service-mgmt.pdf," n.d., p. 22017). While this study focuses on IT GRC adoption in the USG, there may be higher level factors involved cross-state, affecting the higher education governance in general, such as those affecting the differences in types and maturity levels of governance structures in U.S. higher education. One recent study regarding higher education governance, specifically discussing its reform and the factors effecting it, found that their "analysis points to a conspicuous divergence in results consistent with our counter-conventional explanation of governance reform—the political instability hypothesis" (McLendon, Deaton, & Hearn, 2007). The study found that political instability factors, specifically those related leadership changes at the executive and legislature level (party control). Without change at the state leadership level, the status quo is likely to be maintained, which may hinder the adoption of new governance, risk management, and compliance practices at the system level. In the state of Georgia, this may be the case, since Republicans have held control of the state congress and the governorship for some time. Interestingly, the USG has a consolidated governing board with a new Chancellor. Time will tell if this change in leadership will lead to a change in governance practices in the USG.

In this study of institutions in the USG, the evidence points to even lower adoption of ITIL than exists at the national level. Regarding governance in the broader sense, the USG

institutions varied a great deal on what they perceived governance to be, and what should be implemented. Institution A's governance implementation revolved around a shared governance model that included six committees, a maturing Information Security program; and some formalization of incident and change management. Institution B had the least amount of IT GRC of the institutions interviewed, but has begun development of a governance program that is in the process of being approved. Institution C indicated more maturity in the area of governance than A or B, and indicated an understanding of the importance and value of IT GRC. Institution C has buy-in and urgency established at the highest level of leadership, and may become a leader in the area of IT GRC in the USG. Institution D also sees the value of IT GRC, but not at the level of C. Institution D also reports to have a plan of action for IT GRC up for leadership approval. Institution E has established ITIL as the framework for operational governance, and currently has five projects underway to continually improve and mature ITIL and project management processes. Institution E has some buy-in at the cabinet level, but like institution B, the CIO does not report to the president. All of the institutions interviewed scored leadership buy-in, executive understanding, and prioritization high as factors that are important to IT GRC adoption. At most institutions where the CIO reported to the president, it seemed that buy-in to IT GRC was occurring, and that governance implementation projects were beginning to take off. At institution C, where the president exhibits an understanding of the importance of IT GRC and the CIO is a direct report; more resources are beginning to flow to IT for GRC establishment; urgency and importance are beginning to be established at the university leadership level; and transparency and communication flow relative to IT is beginning to occur.

There is evidence from the interview data that institutionalism is a factor that both impedes and supports adoption of IT GRC. The three isomorphic forces that lead to

institutionalism of organizational practices, coercive; mimetic; and normative; are present in varying degrees at the institutions interviewed relative to IT GRC. Coercive pressure is the most significant pressure affecting IT GRC at the institutions, followed by normative and then mimetic. It stands to reason that if the adoption and subsequent institutionalization of IT GRC practices is to occur, that the isomorphic pressures necessary should be maximized. At the institutions studied, this is clearly not the case. There were some coercive pressures in place that stemmed from regulations enforced sporadically by regulatory bodies and auditors, but the most consistent coercive pressure was the USG IT Handbook. This handbook has a number of GRC practices that have a compliance date, and some that are simply recommendations. From the interview data, it appears that the mandatory practices are loosely and sporadically enforced, and that the USG IT office is in the process of coming into compliance itself. This may be the reason for lower normative pressure to establish IT GRC, and the lack of mimetic pressure may be that there are few peers leading by example in the area of IT GRC.

As noted by Pollard and Cater-Steel (2009), "strong, consistent senior management support is the most important requirement for a successful ITIL implementation" and "Any organisation considering ITIL implementation would be well advised to link initiative with corporate strategy to secure executive support before proceeding". In a quantitative study by Iden and Eikebrokke, the authors hypothesized that "As senior management involvement in the ITIL project increases, so does the level of ITIL implementation" (Iden & Eikebrokk, 2014). The hypothesis was supported, providing quantitative evidence of the importance that leadership plays in such governance initiatives, albeit not specific to the buy in component. In another study headed by Cater-Steel that considered the impact of senior management, it was concluded that "necessary to guarantee funding for resources such as training, hardware and software, senior

management support is essential to endorse policy and enforce compliance to the standard processes across the entire organization" (Cater-Steel et al., 2006). The findings by Cater-Steel, Tan and Toleman, and those by Iden and Eikebrokke are consistent with the findings in this study, specifically in the responses to question five, part two, on leadership buy-in, which ranked second in importance to question five, part five on prioritization. Table 4 shows the scores and averages from research question 5.

This study found that proper prioritization was an important factor in the adoption of IT GRC. From the literature, Hu, Hart, & Cooke also found that the importance of prioritization was a factor in information security adoption, and stated that "low priority of security technology investments and internal policy development to top management is likely the main reason for organizational inertia that leads to insecurity" and "that the root causes of insecurity in corporate data and systems can be attributed to the low priority of the security issues in the minds of top management teams and the tendency to maintain the status quo as long as there are no major security incidents occurring" (Hu et al., 2006).

The size of the institution does matter regarding the type and scope of IT governance, but size is not important regarding matters of governance that pertain to governance and risk management. This is supported by Marrone et al in their study on the impact of size on ITIL adoption, as they determined that there was a difference in organizational behavior between small and large organizations due to centralization, structure and complexity, and that small organizations often had flatter structures and were less formal in their procedures and processes. The authors also indicate that "small firms should not be considered to be scaled down versions of large firms"(Marrone et al., 2014).

The 2014 study by Marrone et al hypothesized that adoption of ITIL processes varied by institution size, and the hypothesis was partially supported due to a significant difference in adoption between large and very large institutions in the U.K., indicating that more research was necessary relative to size. Based on the research in the literature and on the information induced in this study, size does seem to matter relative to adoption of IT governance processes relative to scope and number, but not relative to security and compliance governance.

From the interviews, there is evidence that IT GRC adoption is beginning to increase in the USG. Executive buy-in and understanding, resource constraints, and prioritization are all seen as important factors that affect adoption of IT GRC by the interviewees, and most see progress in these areas. The interviewees also see isomorphism as a factor in IT GRC, with coercive pressure being the most prevalent. What is surprising is the lack of normative pressures found during the research. This lack of normative pressure is a significant finding, in that normative pressure comes from professionalization of practice, which is instrumental in the institutionalization of any practice. Without normative pressure, one could only expect IT GRC to be lacking, only dusted off and applied when coercive pressures, such as an audit, exist.

Recommendations for Practice

Based on the findings from this research, I recommend the following for governing systems and institutions of higher education that desire to benefit from the aforementioned values. Entities that desire to implement permanent change related to IT GRC should ensure that adequate and persistent isomorphic pressures exist to institutionalize IT GRC and de-institutionalize existing practices that are counter to best practices. Coercive pressures alone are not sufficient to institutionalize change. A combination of directive pressure by management

and professionalization of the field through education, training and changing hiring practices to include hiring people with skills related to IT GRC will help to increase the rate of IT GRC adoption, and successful adopters will become the institutions to be copied by others. The success of these institutions will cause mimetic pressure to be applied in addition to the coercive and normative pressures, which could cause the adoption rate to further improve.

The identification of areas that require compliance and executive direction or mandate to build governance in accordance with best practice in those areas can aide in that application of coercive pressure. Coercive pressures are most effective when the entity is dependent on another organization, such the relationship between the University System of Georgia and its tenant institutions. In states that have coordinating boards, the coercive pressures may need to come from the legislature, in which case the pressure may be short lived unless statutes are enacted and enforced by oversight, such as audit compliance. Private institutions should establish IT GRC practices through board action, and establish oversight through internal audit. Institutions of higher education are also dependent on accrediting bodies for certification. These accreditors can apply significant coercive force, and therefore could influence the adoption of IT GRC. Another body with coercive power is the U.S. Department of Education, which already leverages its coercive power through the Federal Financial Aid program. Boards and institutions looking for coercive pressure to apply to IT GRC adoption can do so by referencing the authority of the federal government to withhold financial aid from institutions that do not comply with the applicable regulations required for financial aid information systems and data protection.

Education in IT GRC areas and professional development training that covers particular IT GRC skills, coupled with participation in industry best practice organizations, such as ITSMf and Educause, can help apply normative pressure. ITIL training can be taught in a classroom

setting, and the basic course can be completed in three to four days. This type of training can also be completed individually, or through self-paced online courses. A more holistic approach would be through formal inclusion of IT GRC training in undergraduate education, which could be far more impactful in the institutionalization of IT GRC. Since the latter will take years to develop, implement, and spread, looking for graduates of programs that currently list IT GRC type training as part of the curriculum is an alternative.

Changing hiring practices to include job descriptions that have IT GRC skills included, and hiring individuals with those skills can also increase normative pressure. Certifications such as ITIL foundation, COBIT 5, Certified Risk and Information Systems Control (CRISC), Certified Information System Security Manager (CISM) or Certified Information System Auditor (CISA) can be included in job descriptions for IT staff, and hiring staff from outside industries that typically have such skills, such as banking or finance can help with normative pressure.

Finally, in systems where IT GRC adoption is occurring, and some early adopters have taken the lead, mimetic pressure can be applied by executive leadership at institutions still lacking IT GRC practices, indicating that peers that are following best practice and building good practices are leading the way, and should be followed. In parallel with institutionalization of the above, and to help ensure the success of IT GRC adoption initiatives, each entity establishing IT GRC should do the following: 1.) Ensure executive understanding of the value added by IT GRC and obtain executive buy-in. 2.) Establish the priority of IT GRC adoption at as high a level as possible at the institution, and 3.) Ensure adequate resources in the form of staff and funding are applied to the project to ensure success. Throughout the IT GRC project, continue to communicate the value of IT GRC to IT staff to obtain their buy-in and that of all stakeholders that are impacted directly by the change. Substantial organizational change may

necessitate the involvement of third party experts to advise on the proper steps to ensure successful implementation of the change. Organizations such as the American Council on Education (ACE) can bring forward resources and perspectives that could contribute to the professionalization of the areas relative to IT GRC.

Implications for Future Research

There were a number of areas where additional research would help shed light on the reasons for the lack of IT GRC adoption, such as the effect of governing board type; professionalization of practices; and the competition between innovation and operational needs. Governing board types vary by state, so research into the impact of each type of board on the adoption of IT GRC would be beneficial. Research institutions are subject to additional outside forces, and compete nationally and globally, therefore additional examinations of these institutions could be beneficial to the study of IT GRC adoption. The professionalization of practice results from normative pressure applied through the influence of professional organizations. Research into the establishment of professional organizations relevant to IT GRC could help in the understanding of why normative pressure is lacking it higher education IT GRC establishment. Finally, the battle between innovation and operational needs is constant in IT, and understanding this battle is important to prioritizing IT GRC, so more research is needed in this area. Quantitative and empirical analysis of the factors listed above could lead to new hypotheses on IT specific governance, risk management, and compliance constraints that may lead to theory that can be applied to practice.

Conclusion

In conclusion, this study finds that the research questions are supported, and provides indication as to why adoption of IT GRC practices are low in U.S. higher education. Research question one asks "How do resource constraints, institution size, and executive buy-in and education regarding GRC contribute to the variation in adoption practices? This study finds that each of these contribute to the adoption variation of IT GRC as indicated individually below.

Resource constraints are an important contributor to low IT GRC adoption in that the IT staff interviewed felt that they were not adequately staffed or prepared to provide dedicated resources to address IT GRC adoption without adding work to the plates of already fully-tasked staff. One CIO stated, "There has to be adequate funding, adequate staffing, adequate mental capability or mental knowledge" to adopt IT GRC, and "Loading them down with more development of these kinds of things [GRC development] is just not reasonable based on the amount of staffing that we have". One CISO interviewed added that "resource constraints would be top of the list whether it was my time input, or that of the people on the teams, or the reviewers, especially looking at it from [IT GRC development practices] that are internal to IT". So, IT GRC adoption has soft costs, hard costs and opportunity costs, the latter of which is also related to prioritization. While prioritization was not a part of RQ 1, the interview data indicated that it was a significant factor in IT GRC adoption, right behind executive buy-in. This research indicates that perceived resource constraints may be a symptom of low prioritization and low executive buy-in. The research further indicates that professional or academic training in the area of IT GRC, coupled with job descriptions and personnel hires where IT GRC expertise is

part of the job, leads to professionalization of the field and better adoption of GRC through normative pressure.

Executive buy-in is the most important of the factors considered in RQ 1. The majority of the interviewees indicated that executive buy-in, coupled with appropriate prioritization was an effective combination that contributes to the adoption of GRC. This combination aides in removing resource constraints as a factor in low adoption, and helps ensure that staff follow through with IT GRC development and implementation. A CISO mentioned "You have to have executive support so I'm in favor of picking the battles that are necessary that you can win, you don't start off stuck in the battle against yourself, and if you take off down the path of developing any sort of guidance on the completion of tasks without having the backing of those folks [executives]". As mentioned by Cater-Steel "necessary to guarantee funding for resources such as training, hardware and software, senior management support is essential to endorse policy and enforce compliance to the standard processes across the entire organization" (Cater-Steel et al., 2006). Executive buy-in contributes to the adoption of ITIL buy ensuring adequate resources and priority are applied to the problem.

The impact of institutional size on governance adoption was determined to be a factor, in that many governance components are necessary only when an organization outgrows more loosely coupled practices. Research in this area indicate such in research involving the size factor (Cater-Steel & Tan, 2005; Gacenga et al., 2010; Marrone et al., 2014), concluding that "small organisations are different from larger organisations in terms of formalisation, centralisation, complexity, and personnel ratios" and that "small organisations have a flatter structure and are managed by their owners in a management style that encourages entrepreneurship and innovation; they use less formalised decision-making structures and

procedures, and provide more freedom for employees to depart from the rules". All of the institutions interviewed indicated that process governance necessarily increased with the size of the organization. Size of the institution does impact the scope and types of IT GRC that are required. For example, formalized project management, problem management, and other COBIT and ITIL processes are often not implemented when things seem manageable based on small size. Risk management and compliance components were the exception to the size rule, while they may change in scope, each of these are necessary regardless of institutional size.

Research question two asks "How do socio-environmental factors, such as institutionalism, impact the decision to adopt GRC practices? In what ways do organizational change resistance factors, governance structure, or existing IT culture impact the adoption of GRC?" Overall, the answers relative to each vary in impact and importance, but all effect the decision to adopt IT GRC. The components of the question are described in detail in the following paragraphs.

Institutionalism of IT GRC requires the presence of three isomorphic pressures: coercive, mimetic, and normative. All of the interviews indicated the presence of coercive pressures related to IT GRC. The USG IT Handbook, federal and state regulations, and accrediting bodies were listed as sources of coercive pressures. Each of the coercive pressures discussed can been seen as temporary, in that they exist until compliance is obtained, and the associated audit has passed. Normative pressures are those related to professionalization through formal education in a field and hiring personnel with certain skill sets. Normative pressures were found to exist primarily in the area of information security, which indicates that other areas, such as help desk and technical support, lack normalization through professionalization. This lack of normative pressure is a significant factor leading to the low adoption of It GRC. From the interview data,

mimetic pressures were shown to be almost non-existent. Only one institution indicated mimetic pressure to follow another's lead regarding the establishment of IT GRC. With the great variance in governance types and styles found at the institutions, and with each having its own unique mission, this is not a surprise. As stated by Hearn and McLendon, "Returning to Peterson's (1985) memorable imagery of a quarter century ago, postsecondary governance studies dearly have evolved beyond the stage of "advanced adolescence-maturing rapidly, capable of extremes of sophistication and foolishness, and alternately confident and uncertain (p. 6). Whether the field continues its march toward adulthood will depend largely on its growing more confident in its own identity and commitment to substantive, conceptual, and methodological multidimensionality" (2012). Mimetic pressure will likely increase as professionalization is established in IT areas other than information security, and as higher education governance matures and standardizes around practices developed from empirical research. This study concludes that institutionalism, specifically isomorphic pressures; positively impact the adoption of IT GRC when multiple pressures are present.

Surprisingly, in their answer to question 5, organizational change resistance tied for the lowest ranking of factors by the interviewees when taken in the context of the other components. Executive buy-in, executive understanding, prioritization, and IT buy-in were all ranked higher than organizational change resistance (see table 4). I surmise from the interviews that the interviewees did feel that organizational change resistance was an important factor in IT GRC adoption, but that logically if you have executive buy-in and understanding, and then establish the priority of IT GRC, then organizational change resistance will be less of a factor. Furthermore, it follows that with since IT buy-in into the change ranks immediately above

organizational change resistance, that IT staff will not resist the change and in fact may advocate for the change with non-IT staff that art effected by establishing GRC.

The results were similar for the impact of existing IT culture on governance adoption. IT culture ranked third overall in affecting IT GRC adoption, which follows logically and in a similar fashion to organizational change resistance. Inductively, once executive buy-in and prioritization are established, the same needs to happen inside IT. Communicate the importance and priority of the change, and inform IT that the university executives support, or direct, the establishment of IT GRC. These pressures will begin to impact the existing culture in IT, and aid in the de-institutionalization of existing systems and norms where necessary.

The findings from this research indicate that the reasons for low IT GRC adoption in U.S. higher education are related to low executive buy-in, executive understanding, and prioritization of IT GRC, and the lack of significant isomorphic pressures to institutionalize IT GRC, specifically in the area of normative pressure. The values of establishing standardized IT GRC practices include improved efficiency, customer service, information security, and business continuity, all while aiding to ensure compliance while reducing risk.

This study provides for some evaluation of how the primary factors researched affect adoption of IT GRC, and explains why the adoption rate of U.S. higher education IT GRC practices remains low. With an understanding of these reasons, we can begin to develop methods that will aid university leaders in the implementation of IT GRC best practices.

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Appendix A: Interview Template and Questions

Date	Location	Interviewer	Interviewee
Instructions: Use this form to record notes on each interviewee and each question asked. Inform the interviewee that the contents of the interview are confidential, and that final reporting will not list names or locations Attempt to limit time to 10 minutes per question minutes on each discussion item. At the end of each answer, say: Thank you – next question". End the interview again thanking the interviewee for their time.			
Question 1: How do you see your role as it relates to governance and risk management at your institution?			
Question 2: Does your institution currently have a formal IT governance program? If so, how would you rate its security?			

Question 3: If question 1 is “yes” then: Please elaborate on the history of your program? If question 1 is “no” then: Do you plan to implement a formal governance program? What are the factors that impact your decision?
Question 3: What priority do you place on establishing a governance program?

Question 4:

If question 1 was “yes”, then “what roadblocks did you encounter in implementation of GRC?”

If question 1 was “no”, but governance practices are planned for the future, then “what are the driving forces behind the decision to implement governance practices?”

Question 5:

Thinking about factors that affect GRC adoption, Please rate the following statements related to their impact on GRC implementation on a scale of 1-5 where 1 is not significant and 5 is very significant:

1. Resource constraints ____
2. Institutional Leadership buy-in____
3. IT buy-in_____
4. Organizational change resistance_____

5. Prioritization_____
6. IT culture_____

Question 6:

If question 1 is yes:

What other significant factors, constraints or obstacles did you encounter?,

If question 1 is no:

What additional obstacles are impacting your decision to implement GRC?

Table 1

Summary of the literature on International Adoption of GRC Frameworks

Authors	**Method**	**Data**	**Scope**	**Findings**
Marrone et.al. (2014)	Quantitative, empirical research using survey data with an online questionnaire as the instrument	Data from 623 questionnaire responses collected from three surveys.	Surveys of itSMF members from the US,UK and DACH counties	Organizations adopting ITIL implemented more operational level processes than the tactical/strategic level processes. DACH countries exhibit higher ITIL process adoption than the UK, USA, and Australia. Adoption varied on industry sector, and, organization size.
Marrone and Kolbe (2011)	Quantitative methods to produce empirical evidence regarding five propositions using survey data with an online questionnaire as the instrument	Data from 503 completed questionnaire responses	5000 invitations sent to members of itSMF in the UK and US	As the maturity of the ITIL implementation increases the number of implemented processes also increases. As the maturity increases, the challenges of implementation decrease. As the maturity of ITIL increases, so does the number of realized benefits.
Iden and Langeland (2010)	Ranking approach to the Delphi Method (Brainstorming, reducing, and ranking)	Information from questionnaire and subsequent interviews	15 experts from the Norwegian armed forces selected by nomination and then reduction	Method produced a list of 65 success factors in 9 groups, a rank list of the 12 most important factors, and validates the list of success factors.
Bhattacharjya & Chang (2006)	Qualitative case study method	Qualitative data	Compares how IT governance is	How is formal IT governance adopted and implemented within the higher education

	Semi structured interviews		implemented in two Australian institutions of higher education	environment in Australia? Low staffing should not deter the development of governance Adopt the appropriate best practice, or combination thereof Implementation approaches vary Higher education units may benefit from experiences in other industries Project management methodology is important to implementation ITIL documentation is more expensive that COBIT Consolidation of services and improved communications aid in standardization Improving communications

				helps establish partnership with the business
Gacenga, Cater-Steel and Toleman	Comparison of survey data and review of literature relevant to performance measurement. Qualitative data analysis using data reduction, display and conclusion drawing	204 and 503 questionnaire responses in Australia and US/UK respectively, using Survey Monkey for collection and SPSS for analysis	Survey of entire population of Australia's itSMF group compared to a similar study in the US/UK	Australian survey uncovered many benefits at the process level. Rapid adoption of ITIL V3; growing interest in ISO 20000 Returns on ITIL not maximized due to focus on quick wins comparative analysis of the Australian and UK/USA studies reveals that there is limited awareness of performance measurement frameworks.

Table 2

The Benefits and Challenges of GRC and the Associated Frameworks

Authors	**Method**	**Data**	**Scope**	**Findings**
Iden & Eikebrokk, (2014)	Quantitative Field study focusing on Nordic countries Partial least squares linear regression analysis of the dataset	446 responses to the online survey	itSMF members in Finland, Sweden, Denmark and Norway	ITIL can serve as a framework for IT governance in supporting several important processes and relational mechanisms. Seven of eleven hypotheses are supported Three of the antecedents contribute to the level of ITIL implementation: Group efficacy, Organizational resources, and senior management involvement ITIL is instrumental in establishing process management No relationship between organizational stability and ITIL implementation potential of increasing IT governance through implementing the ITIL framework

Marrone and Kolbe (2011)	Quantitative methods to produce empirical evidence regarding five propositions using survey data with an online questionnaire as the instrument	Data from 503 completed questionnaire responses	5000 invitations sent to members of itSMF in the UK and US	As the maturity of the ITIL implementation increases the number of implemented processes also increases. As the maturity increases, the challenges of implementation decrease. As the maturity of ITIL increases, so does the number of realized benefits.
Pollard & Cater-Steel, (2009)	Qualitative Case Study using within-case and cross – case analysis	Interview questions	Four public and private organizations in the U.S. and Australia that implemented ITIL	Critical success factors, including three new ones. Implementation Challenges
Clark & Sitko (2008)	Research bulletin. Discusses trend to use risk management and process improvement frameworks in implement a security program			

Table 3

The Institutional and Organizational Change Lens

Authors	**Method**	**Data**	**Scope**	**Findings**
Cater-Steel, Tan &Toleman (2009b)	Qualitative Case study	Interview data	5 questions specific to ITIL asked of 15 IT Service Managers	analysis at both field and organization level supports the view that ITIL processes have become fashionable and institutionalised; they have travelled through time and space. The three isomorphic pressures have influenced adoption of ITIL
Meyer & Rowan (1977)	Qualitative paper	Qualitative analysis	Affect of institutionalism on organizational structures and practices.	Many formal organizational structures arise as reflections of rationalized institutional rules. The elaboration of such rules in modern states and societies accounts in part for the expansion and increased complexity of formal organizational structures. Institutional rules function as myths which organizations incorporate, gaining legitimacy, resources, stability, and enhanced survival prospects.

				Proposition 1. *As rationalized institutional rules arise in given domains of* *work activity, formal organizations form and expand by incorporating these* *rules as structural elements.* Proposition 2. *The more modernized the society, the more extended the* *rationalized institutional structure in given domains and the greater the number* *of domains containing rationalized institutions.* Proposition 3. *Organizations that incorporate societally legitimated rationalized* *elements in their formal structures maximize their legitimacy and* *increase their resources and survival capabilities.* Proposition 4.*Because attempts to control and coordinate activities in* *institutionalized organizations lead to*

				conflicts and loss of legitimacy, elements *of structure are decoupled from activities and from each other.* Proposition 5. *The more an organization's structure is derived from institutionalized* *myths, the more it maintains elaborate displays of confidence, satisfaction,* *and good faith, internally and externally.* Proposition 6. *Institutionalized organizations seek to minimize inspection* *and evaluation by both internal managers and external constituents.* SUMMARY AND RESEARCH IMPLICATIONS Organizational structures are created and made more elaborate with the rise of institutionalized myths, and, in highly institutionalized contexts, organizational action must support these myths.

DiMaggio and Powell (1983)	Qualitative		Isomorphic pressures as they pertain to the continued bureaucratization of institutions beyond the goal of efficiency.	**Organizational Level Predictors** A-1: The more dependent one organization is on another organization, the more alike they will become A-2: The greater the centralization of resource supply, the more it will change to resemble the organizations it is dependent upon A-3: The more uncertainty exists, the more an organization will model its structure after successful firms A-4: The more ambiguous the goals, the more an organization will mimic a successful one to establish legitimacy A-5: The greater the reliance in using academic credentials to choose managerial staff, the more it will become similar to other organizations. **Field Level Predictors** B-1: The greater the extent the field is dependent upon a single source, the higher level of isomorphism. B-2: The more interaction of the field with the state, the more isomorphism in

				the field as a whole. B-3: The fewer the number of alternative organizational models, the faster the rate of isomorphism B-4: The more technological uncertainty or goal ambiguity, the greater the rate of isomorphism B-5: More professionalism in the field, more isomorphism
Hu, Hart, & Cooke, 2006	Qualitative case study		interviews with seven people	what are the socio-organizational factors that affect the security of information and systems? *found that low priority of* *security technology investments and internal policy development to top management is likely the main reason for organizational inertia that leads to insecurity. Two types of institutional forces seem to be the most effective mechanisms for breaking the* *inertia: coercive forces exerted by regulatory agencies and the normative forces exerted through the influences of*

				professionalism and professional networks
McLendon and Hearn	Qualitative		Discussion and evaluation of the literature on Governance pre and post 1980	Discussion of the governance literature prior to 1980 and then what has emerged subsequently as numerous scholars turned their attention to the topic. In dosing, we consider some potential arenas for the next generation of research on the topic
Armenakis and Bedian	Qualitative Review		Review and discussion of organizational change literature from 1990-1998	Five observations about the current state of organizational change theory
Cater-Steel and Tan	Quantitative Survey with within case and cross case analysis	Survey data	Survey of ITSMf members in Australia, consisting of 110 responses	proposes that the widespread adoption of ITIL by service providers has resulted in homogeneity of ITSM processes. As a result, internal IT departments and external IT Service Providers can be viewed as isomorphic in terms of their processes, vocabulary, and position descriptions. provide confidence to IT managers that the new architectures and methodologies deployed will work as intended, improving service levels

				and reducing costs. Concludes that all three types of Isomorphic pressures have been instrumental in the institutionalization of ITIL

Table 4 - Interview question 5 score sheet

	question	Inst A	Inst B	Inst C	Inst D	Inst E	Ave	overall ave
CIO	RC	4	2	3	3	4	3.2	3.7
	Lead buy-in	3	5	5	2	2	3.4	4.2
	IT-buy in	4	3	5	4	2	3.6	3.7
	OCR	4	4	4	4	2	3.6	3.7
	Pri	4	4	4	5	5	4.4	4.4
	cult	5	3	5	5	4	4.4	3.9
IT	RC	3	4	5	4	4	4.0	
	Lead buy-in	5	5	4	3	5	4.4	
	IT-buy in	3	5	3	2	2	3.0	
	OCR	4	3	3	4	3	3.4	
	Pri	4	4	3	4	5	4.0	
	cult	4	4	3	3	3	3.4	
other	RC	5	5	4	1	5	4.0	
	Lead buy-in	5	4	5	5	5	4.8	
	IT-buy in	5	4	5	3	5	4.4	
	OCR	4	3	4	5	4	4.0	
	Pri	4	5	5	5	5	4.8	
	cult	5	3	4	3	4	3.8	