# Exploring differences between smaller and large organizations' corporate governance of information technology

Carla L. Wilkin [a,*], Paul K. Couchman [1], Amrik Sohal [b], Ambika Zutshi [c]

[a] Department of Accounting, Monash Business School, Monash University, Caulfield East, Victoria, Australia
[b] Department of Management, Monash Business School, Monash University, Caulfield East, Victoria, Australia
[c] Department of Management, Deakin Business School, Deakin University, Geelong, Australia

## ABSTRACT

Corporate governance of information technology (CGIT) is targeted at maximizing IT investment to achieve business objectives and value. Yet there is little empirical evidence about organizations' attitudes to and use of CGIT to deliver such value, or the role of related policies, practices, frameworks and methodologies. This study explored the views of Chief Information Officers and executive managers of smaller and large, primarily Australian organizations, regarding governance of IT. Through a survey, we investigated their views regarding the perc eived relevance, influential drivers, challenges and perceived benefits from the use of CGIT. Regardless of organizational size, our findings demonstrate substantially the same benefits, influences and challenges. Further, besides the widely acknowledged importance of strategic alignment of business and IT, risk management was found to be significant both in influencing the decision to adopt CGIT and as a perceived key capability for delivering improved organizational performance and resource-based value. As such, the study contributes new knowledge related to delivering business value through governing IT.

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## 1. Introduction

Given information technology's (IT's) pervasive role in organizational processes that support business objectives, and with global IT expenditure projected as $3.7 trillion in 2015 (Gartner, 2015), value delivery from IT investment remains a concern (Kohli and Grover, 2008; Wilkin et al., 2013; Wu et al., 2015). Our paper focuses on corporate governance of information technology (CGIT), a subset of corporate governance, particularly its strategic focus on improved organizational performance and maximizing IT value. Defined as "the responsibility of the board of directors and executive management, CGIT … consists of the leadership and organizational structures and processes that ensure that the organization's IT sustains and extends the organization's strategies and objectives" (ITGI, 2003 p. 10).

To enhance IT's capability to create business value, a number of CGIT-related tools and management systems have been developed. These include: PRINCE2 (Projects in Controlled Environments), ITIL (IT Infrastructure Library), COBIT[2] (Control Objectives for Information and Related Technology), Val IT (Value from IT investments) and ISO/IEC 38500:2008 (an international standard

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\* Corresponding author.
  E-mail addresses: carla.wilkin@monash.edu (C.L. Wilkin), couchmanp@optusnet.com.au (P.K. Couchman), amrik.sohal@monash.edu (A. Sohal), ambika.zutshi@deakin.edu.au (A. Zutshi).
  [1] Consultant.
  [2] Given the timing of the survey, respondents could have answered in terms of COBIT 4.1 and/or COBIT 5.

for CGIT). Whilst the body of research concerned with IT governance issues in Australia is growing (e.g., Zhao et al., 2008; Campbell et al., 2009; Robb and Parent, 2009; Wilkin and Riddett, 2009; Wilson and Pollard, 2009; Wilkin et al., 2013), few studies have explored practitioner views of CGIT, including the influences, challenges and perceived benefits related to an organizations' application of CGIT policies and practices. Research is also lacking regarding how organizations perceive ISO/IEC 38500:2008's principles to be relevant. Our research aims to address these knowledge gaps through a survey in Australia of business and IT executives from large (LO) and smaller (SO) organizations whose roles engage with CGIT. Moreover, recognizing that resource-constrained SOs face significant challenges in managing their assets to achieve sustainable competitive advantage (Beck et al., 2005; Cragg et al., 2011), our research aim was also to investigate any perceived differences between SOs and LOs in this regard. Besides such perceptions, the survey collected quantitative data about each organization, the status of CGIT policy and related responsibilities.

Findings from the 143 respondents (43 from SOs and 100 from LOs) showed the key implications as: SOs were equally engaged with CGIT and business/IT alignment as their LO counterparts; that human engagement with CGIT was a primary source of challenge for both (with strategies related more to defining accountabilities than upon control); and that risk management was a primary influence upon organizations of both sizes to engage with CGIT. In particular, we found: that (1) project management methodologies had higher levels of awareness and implementation than frameworks more directly related to IT governance; (2) the meaning of CGIT was construed in terms of IT alignment and value from IT; and (3) LOs were more likely to have a written policy than SOs. Influences for CGIT policy development reportedly relate to focusing on what IT could do for the organization (risk management and achieving alignment) rather than the issue of adequate organizational resources.

Benefits achieved by CGIT were found to include alignment of IT with business needs, and definition of accountabilities and responsibilities. Identified challenges primarily concern human issues (i.e., acceptance, commitment, communication and change management). Structural mechanisms by which to achieve CGIT were found to be formal in nature, i.e., IT steering committees (mainly LOs), formal policies and procedures and the Chief Information Officer's (CIO) role on the board. There was general agreement with ISO/IEC 38500:2008's principles for CGIT, particularly regarding CGIT's role in ensuring regulatory compliance, appropriate delegations being in place and IT being fit for purpose.

The study's relevance can be gauged from evidence of high-profile IT project failures (e.g., Hutchinson, 2010; Toomey, 2009) and organizations' failure to realize benefits from IT investments (e.g., Barua et al., 2010). For example, a Commission of Inquiry into Queensland Health's payroll IT disaster reported that this failure related to governance practice, not the relevant standards (Chesterman, 2013). Even so, Standards Australia released an updated Information and Communications Technology (ICT) governance standard as a response (Clarke, 2014). Similarly, conflicted reports are evident in the USA. The US Air Force's development of the Expeditionary Combat Support System, which was scrapped after spending over a billion dollars for reportedly "zero results" (Shaw, 2012 p. 1), has been attributed to the lack of an assigned "accountable leader" who would exercise authority to enforce organizational changes necessary for successful project implementation (Stross, 2012 p. 2). In other words, the failure was in the exercise of IT governance, not necessarily in the relevance of an applicable standard.

These scenarios suggest that investigation is required into what constitutes current CGIT practice, the relevance of related tools/standards, and their capability to deliver organizational value from IT. In reporting our investigation, the paper is organized as follows. After reviewing the relevant literature, we introduce our theoretical perspective. We then outline the research methods and the study's context. After discussing our findings and their implications, we outline limitations and suggest opportunities for future research.

## 2. Background and theory

In this section, we link the two themes of literature that underpin the study, namely that:

1. as an organizational capability, CGIT is a means to govern organizational IT assets in order to deliver organizational value; and
2. in accord with the resource-based view (RBV), the organizational competence that deploys assets and capabilities in order to create value, relates to organizational size.

The section concludes with the four research questions that direct our investigation.

### 2.1. CGIT for organizational value

#### 2.1.1. Corporate governance and CGIT

Corporate governance is the system that directs and controls organizations to manage their operations effectively in order to meet stakeholder expectations concerning financial and environmental matters (Cadbury, 1992; OECD, 1999). In its long history (Shleifer and Vishny, 1997; Daily et al., 2003), a number of challenges have been identified. These include: problems created by separating ownership and control in modern corporations (Berle and Means, 1932); the limited role of boards given managerial hegemony within these corporations (Mace, 1971); and how corporations could prosper despite evident self-interest propensities in managers' behavior (Jensen and Meckling, 1976).

Reflecting IT's growing importance to organizations' operations and performance, CGIT has become a more recent focus (Calder, 2008; Wilkin et al., 2013). Despite some varied nomenclature (e.g., Henderson and Venkatraman, 1993; Weill, 2004; Van Grembergen and De Haes, 2009; ISACA, 2012), a common theme of burgeoning CGIT research concerns ensuring that IT-related decision-making is directed towards achieving organizational goals and objectives, including as part of organizational governance.

Research into generating value from/through IT has generally focused on IT productivity, and achieving value through IT capability (Lim et al., 2011). Value creation is often conceptualized through strategic business/IT alignment, with recognition that "the next generation of IT value studies should focus on the co-creation of value through IT rather than on IT value alone" (Kohli and Grover, 2008 p. 28). This is challenging "in an environment characterized by networks of inter-firm relationships, increasing prevalence of data and sophisticated analytics, and hyper-competition that requires agility and responsiveness as critical outcomes in the marketplace" (Kohli and Grover, 2008 p. 36). In such contexts where organizational agility and capability are important, CGIT becomes essential to reduce risk and target IT capabilities that deliver on objectives (ITGI, 2009; Kohli and Grover, 2008). Yet few studies have reviewed organizational perceptions of what influences CGIT adoption, perceived benefits and challenges associated with the application of CGIT principles (De Haes and Van Grembergen, 2010; Higgins and Sinclair, 2008; Wilkin and Chenhall, 2010), or the perceived relevance of the related frameworks and methodologies.

### 2.1.2. Delivering CGIT: Related frameworks, methodologies and a standard.

In response to building capability and increasing business value, industry-based associations such as ISACA, PMI and ITGI[3] have developed and promulgated tools and governance/management systems. Whilst our study primarily focuses on CGIT principles as evidenced in ISO/IEC 38500:2008, a comparative review of these tools, management systems and frameworks is reported in Table 1 (see below).

Each standard/framework/methodology has its own emphasis (see Fig. 1). ISO/IEC 38500:2008 and ISACA's COBIT 5 have strategic focus. ISO/IEC 38500:2008 focuses on six principles that guide boards and directors in their governance of IT. COBIT 5, whilst sharing this governance focus, has much more detail about the principles and tasks (enablers) that should be acted upon in order to achieve the desired corporate focus on governing and managing IT. COSO shares this strategic focus, but with emphasis on risk management and internal controls to enable good organizational governance rather than specifically IT governance. Val IT, Risk IT and COBIT 4.1 preceded ISACA's COBIT 5, with the focus of each being specific guiding principles, governance and management practices related to the organizational foci of value, risk and control objectives, respectively (as reflected in their title viz. see Table 1). Others (ITIL, CMMI and Prince 2) are more related to project management: ITIL has a service delivery focus; CMMI a capability maturity focus as related to products and services; and Prince2 is a high-level project management and control methodology.

### 2.2. An RBV perspective on CGIT: Theorizing smaller and large organizations' differences

Our adopted perspective is grounded in the RBV of the organization, as "the theory provides a cogent framework to evaluate the strategic value of information systems resources" (Wade and Hulland, 2004 p. 109). Its premise is that to achieve sustainable competitive advantage, an organization should possess valuable, rare, inimitable and non-substitutable resources together with organizational capabilities to exploit the full potential of those resources (Barney, 2001; Barney and Mackey, 2005). We contend that for organizations to have a dynamic, fully operational and high performing IT function, *a core capability is effective IT governance*, i.e., "Integrating Information Systems (IS)/IT effort with business purpose and activity" (Feeny and Willcocks, 1998 p. 12). The particular significance of RBV for IS research is as "a valuable way for IS researchers to think about how information systems relate to [an organization's] strategy and performance.

Here RBV's distinction between assets and capabilities is important. Firstly, resources comprise *assets*, i.e., "anything tangible or intangible a firm can use in its processes for creating, producing and/or offering its products (goods or services) to a market"; and *capabilities*, i.e., "repeatable patterns of actions in the use of assets to create, produce and/or offer products to a market" (Wade and Hulland, 2004 p. 109). Tangible assets, such as IT systems, are not a source of sustainable competitive advantage, as they are easy resources for competitors to imitate. Rather, sources of advantage may include deployment of distinctive capabilities such as managerial abilities together with intangible assets such as software patents and integration of business and IT strategies (Prasad et al., 2012; Debreceny and Gray, 2013). This RBV view emphasizes how competitive advantage may be achieved by resource complementarity. (i.e., Kraaijenbrink et al., 2010).

From this RBV perspective, "the alignment between IT and complementary resources is what ultimately makes IT a potential competitive enhancing resource" (Weingarten et al., 2013 p. 32). The better that these two sets of resources are aligned, "the more likely a firm is to develop IT-based organizational capabilities that can be a source of long-term performance improvement" (Weingarten et al., 2013 p. 41). Research provides inconclusive answers regarding the relationship between CGIT, building organizational capabilities and RBV, including as impacted by organizational size. CGIT has been shown to: moderate the influence of IT-relatedness on organizational performance (Tanriverdi, 2006); be linked to organizational performance through efficiency gains (Lunardi et al., 2014); contribute to performance through improved IT-related capabilities (Prasad et al., 2012); and be mediated in its effect on performance by IS alignment (Wu et al., 2015).

Thus, there is little consensus about the benefits of CGIT to RBV, or how to derive these in practice. We argue that the development of effective IT governance mechanisms within an organization, with related organization-specific components of leadership, structures, processes and relational mechanisms (Burtscher et al., 2009), constitutes a distinctive organizational competence. In this, we construe a competence as a systemic ability to deploy combinations of resources to create a specific set of capabilities (Teece et al., 1997). IT governance competence creates IT-related capabilities for the organization, i.e., CGIT should contribute organizational IT capabilities and competence through: (1) strategic alignment between business and IT, so IT investments deliver value to the business; and (2) alignment of IT and non-IT organizational resources to achieve resource complementarity as related to strategy, structures, processes and culture (i.e., Weingarten et al., 2013). This competence and associated IT-related capabilities are specific, distinctive

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[3] Information Systems and Audit Control Association (ISACA), Project Management Institute (PMI), and IT Governance Institute (ITGI).

**Table 1**
Standard, frameworks and methodologies designed to address aspects of IT governance and management (as related to Fig. 1).

| | Focus | Target | Coverage |
|---|---|---|---|
| *Standard* | | | |
| ISO/IEC 38500:2008 | A framework of principles that directors can use when evaluating, directing and monitoring IT use in their organization (ISO/IEC 38500:2008) | Boards | Provides guidance on CGIT via 6 "good practice" principles (responsibility, strategy, acquisition, performance, conformance and human behavior), each with its own set of recommended practices structured under 3 task areas (evaluation, direction and monitoring) |
| *IT governance and management frameworks* | | | |
| COBIT 5 | A "comprehensive framework that assists enterprises in achieving their objectives for *the governance and management of enterprise IT* … [to] … create optimal value … by maintaining a balance between realistic benefits and optimizing risk levels and resource use … considering the IT-related interests of internal and external stakeholders" (ISACA, 2012 p. 13) | Boards and top management | COBIT 5, released in April 2012, consolidates and integrates COBIT 4.1, Val IT 2.0 and Risk IT, and draws from ISACA's IT Assurance Framework and the Business Model for Information Security. It aligns with frameworks and standards such as ITIL, International Organization for Standardization (ISO), Project Management Body of Knowledge (PMBOK), PRINCE 2 and The Open Group Architecture Framework (TOGAF). It is framed with 5 principles and 7 organizational resources called *enablers* |
| Val IT | Through a governance framework, Val IT assists in creating business value from IT investments | Business managers | It contains a set of guiding principles and processes with suggested key management practices related to 3 domains (value governance, portfolio management and investment management) |
| Risk IT | End-to-end view of all risks related to the use of IT and their treatment via risk management | Business managers and boards | It focuses on 3 domains (risk governance, risk evaluation and risk response), which are detailed by process components, management practice, inputs and outputs, RACI charts, goals and metrics |
| COBIT 4.1 | Provides an *internal control framework* for IT by requiring organizations to define their motivation for IT investment, the stakeholders and the desired outcomes (ITGI, 2007) | Business managers and boards | The title means Control Objectives for Information and Related Technology. By linking business goals to IT goals, it identifies the associated responsibilities of business and IT process owners, and through metrics and maturity models, measures the achievement of goals |
| COSO | An integrated framework concerned with Enterprise Risk Management (ERM) and related Internal Control. It views Internal Control as a process effected by an entity's board, management and others to manage risk | Boards and top management | A cube with 4 organizational objectives, 8 risk management components and 4 organizational units |
| *Methodologies for IT projects and IT operations* | | | |
| ITIL | IT service management and operations | IT service providers | Service delivery through IT as a whole-of-organization engagement |
| CMMI | Focuses on product and service development, establishing and managing services and acquiring related products and services | Organizations | A program for process improvement, training and appraisal |
| Prince 2 | A project management methodology that encompasses high-level management, control and organization in a project | Project managers | Project management |

to the organization, non-substitutable and often difficult to imitate (not least because they are embedded within the organization's culture and routines). As such, according to the RBV, they are a source of sustainable competitive advantage.

*2.2.1. Organizational size and resource constraints*

In comparison to LOs, SOs are resource-constrained (most notably of finance, specialist personnel and management capabilities). These constraints are widely acknowledged as limiting SOs' competitiveness and capabilities in areas such as innovation (Kleinknecht, 1989; Rosenbusch et al., 2011), knowledge management (Hutchison and Quintas, 2008; Durst and Edvardsson, 2012) and IT/IS competency (Tippins and Sohi, 2003; Cragg et al., 2011). On this basis, we would expect evidence that SOs make limited use of IT governance frameworks, methodologies and formal policies. Two particular resource constraints inform this expectation. Firstly, a lack of personnel with specialist knowledge in CGIT issues could lead to SOs' reduced absorptive capacity (Zahra and George, 2002). With less internal capability to identify, assess, acquire and apply IT knowledge (Madrid-Guijarro et al., 2009), SOs could face significant obstacles in developing distinctive IT governance competence. This is consonant with the contingency approach of Sambamurthy and Zmud (1999), who argued that IT-related absorptive capacity was one of three determinants of an organization's IT governance arrangements (the other two being corporate governance and economies of scope).

Secondly, SOs tend to have fewer managerial resources and skills (Georgiadis and Pitelis, 2012) despite such capabilities being arguably critical for organizational growth (Penrose, 1959). For example, managerial capability constraints, deriving from limited knowledge, experience, training and development (Fuller-Love, 2006), can limit the development of critical IS capabilities in areas such as strategy formulation, defining IT's contribution and capability, exploiting IT investments and delivering IT-business solutions (Peppard and Ward, 2004). Further, poor managerial competence is reportedly linked with small business failure (Walker
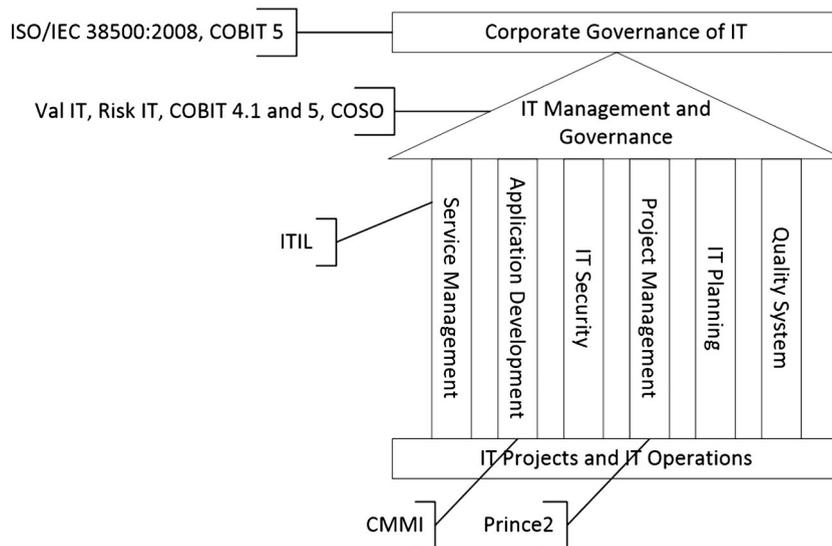
**Fig. 1.** Relationship between the frameworks, methodologies, standard and their primary IT-related functions (adapted from Cater-Steel et al., 2006 and in turn Ratcliffe, 2004).

et al., 2007). With such limited management capacity, SOs may well lack the competence through which IT and business interdependencies are effectively addressed.

To investigate these issues, including differences between SOs and LOs with respect to CGIT, our research questions were:

RQ1:  What is the extent of awareness and/or implementation among IT and business executives regarding the identified IT governance and management frameworks?

RQ2:  What are the views of IT and business executives concerning the meaning of CGIT?

RQ3:  For organizations with a CGIT policy, what practices are followed in formulating and communicating this policy? What influences adoption of CGIT as a policy? What are perceived as the principal benefits and challenges associated with implementing CGIT? What structures, processes, mechanisms and resources support CGIT?

RQ4:  Given its specific CGIT focus, to what extent are ISO/IEC 38500:2008's principles followed in respondents' organizations?

## 3. Context, research method, sample and data analysis

### 3.1. Research context: Smaller and large organizations

The decision to compare SOs and LOs stems from the important yet distinct economic and employment contributions each make to national economies, including through investment in IT. Whilst no universal classification exists, the distinction between small enterprises (SE), medium enterprises (ME) and large enterprises (LO) is customarily made based on employee numbers. Here, variances are apparent. For example:

1. In the European Union, small-and-medium enterprises (SMEs) are defined as having ≤250 employees (micro <10, SEs 10–49 and MEs 50–249 employees) and larger enterprises >250 employees (Edinburg Group, 2012).
2. In South Africa, an SME in the finance and business services sector has ≤200 employees (Edinburg Group, 2012).
3. The US classifications vary by industry sector. One defines SEs as having <100 and MEs as <500 employees (Edinburg Group, 2012). Alternatively, the United States International Trade Commission (USITC) defines SMEs as employing <500 (USITC, 2010).
4. In China, for the software, IT service and business services sector, SEs are classified as those with ≥10 but <100, MEs with ≥100 but <300, and LOs as ≥301 employees (China Briefing, 2011).
5. The Australian Bureau of Statistics (ABS, 2012) defines SMEs as employing <200 (SE <20 and ME 20–199), with LOs employing ≥200.

Given such global variations, particularly regarding the distinction between SEs and MEs, and the Australian focus for the survey, we chose to classify enterprises according to the Australian Bureau of Statistics' definition, but use only two categories, namely SOs with ≤199 employees and LOs with ≥200 employees.

Regarding IT investment, in 2008–2011, Australian LOs spent 30% of total investment on new technologies (Deloitte, 2012). Related evidence of similar objectives for SMEs include: (1) in May 2013, 94% "of SMEs had an internet connection" and were active online; (2) 94% of connected SMEs used the internet for communication purposes (banking was the next 77%); and (3) 50% "of connected SMEs performed seven or more different types of online activities including multiple types of communications, financial transactions, search and information and marketing" (ACMA,[4] 2014 pp. 1–2). Yet comparison of online sales with orders illustrates some lagging by

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[4] Australian Communications and Media Authority.

Australian SOs. For example, in the period 2013–2014, 87.5% of LOs placed orders online vs 73.8% of MEs and 56.5% of SEs (ABS, 2015). Orders received online were LOs 48.2% vs MEs 45.6% and SEs 34.4%. For the same period (ABS, 2015), LOs' internet income was AU$b146.2 vs MEs' estimated as AU$b59.2 and SEs' A$b30.7. These figures, together with SMEs being collectively estimated to have generated 57% of total business income for June 2011–2012 (ACMA, 2014), suggest their business objectives are less IT-focused than LOs.

### 3.2. Research method

Through an anonymous Qualtrics survey conducted over a 25-week period in 2013/2014, we targeted business executives and Chief Information Officers (CIOs) from primarily Australian SOs and LOs. Variation in organizational size presented a unique opportunity to investigate common relationships and appreciate differences (Sonquist and Dunkelberg, 1977; Gable, 1994).

Besides background information about respondents' experience and their organizations' size, our survey addressed our four research questions (see Section 2.2.1). Survey items were developed using a deductive approach. Firstly, we drew on knowledge of CGIT acquired from prior studies. Secondly, we used input from a project editor for ISO/IEC 38500:2008. Thirdly, we fine-tuned the instrument using members of an ISACA chapter (where membership would indicate interest and/or work-related expertise with IT governance), and finally pilot-tested it with six experts who independently contributed CGIT-related knowledge. Resultant minor revisions addressed comprehensibility, question relevance and completion time.

To reach our target audience, non-probability convenience sampling (Neuman, 2011) was used as a cost-effective, convenient and acceptably rigorous approach (De Vaus, 2002; Alreck and Settle, 2004). We conducted the survey in partnership with an Australian organization whose strong online presence and publication of a leading practitioner magazine matched our target audience. Besides placing a link on the home page of their online magazine, the survey was promoted on LinkedIn and at the magazine's public events such as summits and road shows. To enhance response rates, respondents could enter into a draw for an Apple iPad.

### 3.3. Description of the sample

In total, 190 people connected to the survey website, with 144 answering most items. After eliminating one response for capricious answers, our final sample comprised 143 respondents: 127 (89%) male and 16 (11%) female. Given the survey's specific nature and our target population, when compared with our partner magazine's "annual state of the CIO" survey with just over 200 respondents in 2013, we argue a satisfactory response. Overall, 30.1% of respondents held the position of CIO; 16.8% were IT Directors; 13.3% Operations Managers; with others including primarily IT and senior management personnel (see Table 2 below). Hence, we reached our target population, namely middle- to upper-level managers or executives with links to IT roles. Using the categorization explained in Section 3.1, we categorized the 143 organizations represented as:

1. 100 being classified as LOs, i.e., the range was 200–9000 employees with the median being 1500 employees and the mean 7322.
2. 43 being classified as SOs. Most (30) had 20–190 employees, the remainder (13) up to 18 employees, with the median being 50 employees and the mean 57.

Given this, we report our findings in terms of SOs and LOs.

As current economic conditions have engendered fluidity in the corporate environment, unsurprisingly 101 (71%) respondents had been in their current *position* for ≤5 years; and 97 (68%) respondents in their current *organization* for ≤5 years (see Table 2). Only 1.4% had held their position >20 years, with 3.5% being in their organization >20 years. Such trends were consistent regardless of organizational size. Whilst respondents represented diverse industry sectors, most were from government administration and defence (21%), finance and insurance (10.5%), education (9.8%) and manufacturing (7%). Interestingly, 83.9% of respondents' organizations had headquarters in Australia (US next at 7%), with six Australian states represented. As such, we acknowledge the potential for Australian bias.

### 3.4. Data analysis

We analyzed the quantitative data using SPSS v20. Having differentiated respondents based on organizational size, in accord with conventional statistical practice, we used two tests of significance to compare the two groups: the *t*-test where means were compared, and the chi-square test for contingency tables where the variables were nominal data. In each test, the null hypothesis was proved, i.e., there was no difference between SOs and LOs.

For the open-ended questions, we used qualitative data analysis to interrogate responses (single words, phrases and/or sentences). Through analytical induction manual thematic analysis, we identified categories or themes (Braun and Clarke, 2006; Guest et al., 2011). Here, rather than drawing on any theoretical perspective or a priori framework, three experts derived categories from the data in a process akin to "open coding" (Glaser and Strauss, 1967; Strauss and Corbin, 1990). In doing so, using a coding sheet without prompts, each expert independently categorized responses according to what he/she identified as emergent themes. This semantic analysis (Braun and Clarke, 2006) was oriented towards description and interpretation of the broader meanings encapsulated in these identified themes. When tallied for SOs and LOs, findings showed strong inter-rater reliability (about 88%).

Having detailed our context, method, sample and analytical approaches, in the next section we report our findings.

**Table 2**
Descriptive statistics of the sample[a].

| | SOs, n = 43 | LOs, n = 100 | Overall, n = 143 |
|---|---|---|---|
| *Gender* | % | % | % |
| Male | 81.4 | 92 | 88.8 |
| Female | 18.6 | 8 | 11.2 |
| | | | |
| *Position* | | | |
| Chief Executive Officer (CEO) | 4.7 | 1 | 2.1 |
| Chief Information Officer (CIO) | 20.9 | 34 | 30.1 |
| IT Director | 16.3 | 17 | 16.8 |
| Chief Operating Officer (COO) | 2.3 | | 0.7 |
| Operations Manager | 11.6 | 14 | 13.3 |
| Other | 44.2 | 34 | 37.1 |
| | | | |
| *Time in position (years)* | | | |
| 0–2 | 44.1 | 31 | 35 |
| 3–5 | 27.9 | 39 | 35.7 |
| 6–10 | 11.6 | 19 | 16.8 |
| 10+ | 13.9 | 11 | 11.9 |
| Missing | 2.3 | | 0.7 |
| | | | |
| *Time in organization (years)* | | | |
| 0–2 | 44.1 | 29 | 33.6 |
| 3–5 | 27.9 | 37 | 34.3 |
| 6–10 | 6.9 | 22 | 17.5 |
| 10+ | 18.5 | 10 | 12.6 |
| Missing | 2.3 | 2 | 2.1 |
| | | | |
| *Industry* | | | |
| Accommodation, cafes and restaurants | | 1 | 0.7 |
| Retail trade | 9.3 | 1 | 3.5 |
| Communication services | 2.3 | 5 | 4.2 |
| Cultural and recreational services | | 1 | 0.7 |
| Transport and storage | 2.3 | 5 | 4.2 |
| Electricity, gas and water supply | | 5 | 3.5 |
| Education | 4.7 | 12 | 9.8 |
| Government administration + defence | 18.6 | 22 | 21 |
| Finance and insurance | 7 | 12 | 10.5 |
| Health and community services | 7 | 3 | 4.2 |
| Manufacturing | 4.7 | 8 | 7 |
| Mining | 4.7 | 3 | 3.5 |
| Construction | | 4 | 2.8 |
| Property and business services | 2.3 | 5 | 4.2 |
| Personal and other services | 4.7 | | 1.4 |
| Others IT/ICT | 6.9 | 5 | 5.6 |
| Others professional services | | 3 | 2.1 |
| Others (management) consulting | 9.3 | | 2.8 |
| Others various | 16.1 | 5 | 8.4 |

[a] Not all respondents completed every item, resulting in missing data. This missing data could be due to factors such as respondent fatigue, unwillingness to divulge or ascertain specific data, time pressures and or perceived lack of knowledge about a question/set of questions.

## 4. Findings

### 4.1. Awareness and implementation of frameworks and methodologies that assist with CGIT

We explored awareness and implementation of CGIT (*RQ1*) as related to the standard/methodologies/frameworks presented in Fig. 1 (see Section 2.1.2, Table 1). Respondents (*n* = 138, i.e., SOs 41 and LOs 97) answered by indicating (via a tick) which of the identified IT governance and management frameworks (see Table 3 below) they were aware of and/or was implemented in their organization. Holistically, our findings reveal medium levels of awareness of Val IT, COBIT and Risk IT (frameworks related to IT management and governance—42.7%, 56.6% and 44.8%, respectively), but low levels of implementation (5.6%, 19.6% and 14.7%, respectively). In comparison, methodologies that facilitate project management, such as Prince 2, have higher instances of implementation (53.1%).

Regarding awareness of COBIT, the results were almost identical (SOs 58.1% vs LOs 56%), yet LOs' implementation was more than double (9.3% vs 24%) and significant at the 0.1 level (chi-square = 5.34, *df* = 2, *p* < 0.1). This difference was not apparent for Val IT and Risk IT. Awareness and implementation of COBIT ranked third (76.2%) behind Prince 2 (86.7%) and ITIL (92.3%), with differences between SOs and LOs for Prince 2 and ITIL being significant at the 0.05 level (for Prince 2, chi-square = 6.31, *df* = 2, *p* < 0.05; and for ITIL, chi-square = 18.57, *df* = 2, *p* < 0.01).

**Table 3**
Awareness and implementation of frameworks and methodologies that assist with CGIT.

|         | Val IT |      |       | COBIT |      |       | Risk IT |      |       | COSO |      |       |
|---------|--------|------|-------|-------|------|-------|---------|------|-------|------|------|-------|
|         | Aware  | Imp. | Total | Aware | Imp. | Total | Aware   | Imp. | Total | Aware | Imp. | Total |
| SOs     | 44.2   | 7    | 51.2  | 58.1  | 9.3  | 67.4  | 53.5    | 11.6 | 65.1  | 39.5 | 4.7  | 44.2  |
| LOs     | 42     | 5    | 47    | 56    | 24   | 80    | 41      | 16   | 57    | 36   | 7    | 43    |
| Overall | 42.7   | 5.6  | 48.3  | 56.6  | 19.6 | 76.2  | 44.8    | 14.7 | 59.4  | 37.1 | 6.3  | 43.4  |

|         | CMMI  |      |       | Prince 2 |      |       | ITIL  |      |       | Other* |      |       |
|---------|-------|------|-------|----------|------|-------|-------|------|-------|--------|------|-------|
|         | Aware | Imp. | Total | Aware    | Imp. | Total | Aware | Imp. | Total | Aware  | Imp. | Total |
| SOs     | 44.2  | 11.6 | 55.8  | 44.2     | 37.2 | 81.4  | 53.5  | 32.6 | 86    | 14     | 7    | 20.9  |
| LOs     | 46    | 17   | 63    | 29       | 60   | 89    | 24    | 71   | 95    | 3      | 11   | 14    |
| Overall | 45.5  | 15.4 | 60.8  | 33.6     | 53.1 | 86.7  | 32.9  | 59.4 | 92.3  | 6.3    | 9.8  | 16.1  |

Note: Numbers are reported as percentages. *The "other" category included Agile, ISO 27001, PMBOK and TOGAF.

### 4.2. Views about the meaning of CGIT

To investigate whether IT and business executives in SOs and LOs viewed CGIT's meaning differently (*RQ2*), we presented them with six options that were derived from practitioner and research sources (see Appendix 1 for sources and details) and asked them to select any/all that applied (see Table 4). These options were based upon ISO/IEC 38500:2008's definition of CGIT as "the system by which the current and future use of IT is directed and controlled…. [and] involves evaluating and directing the use of IT to support the organization and monitoring this use to achieve plans" (p. 3). Respondents from 36 SOs and 91 LOs ($n = 127$) answered, with the highest percentage of respondents construing CGIT in terms of IT alignment and value from IT, e.g.:

"A responsibility of executives and the board of directors aimed at ensuring the organization's IT systems sustain and extend its strategies and objectives" (SOs 53.5% vs LOs 59%); and

"A set of mechanisms to request, prioritize, sponsor, fund, monitor, and enforce IT investment decisions in order to ensure the resulting IT investments deliver value to the organization" (SOs 53.5% vs LOs 58%).

It is interesting that regardless of organizational size, the least popular view was ISO/IEC 38500:2008′s definition, i.e.,

"The system by which the current and future use of IT is directed and controlled within an organization" (SOs 39.5% vs LOs 41%).

These results confirm that respondents appreciate CGIT's strategic organizational role and the need for mechanisms by which to devolve authorities (see Table 9).

### 4.3. CGIT policy: Practices, influences, benefits, challenges and supporting mechanisms

#### 4.3.1. Practices followed in formulating and communicating CGIT policy

To examine the presence and practice of CGIT policies (*RQ3, Part 1*), we asked a range of questions (see Table 5). Despite general agreement about CGIT's meaning, policy formulation and communication were manifested differently in practice (see Table 5). For example, LOs (56.1%) had a written CGIT policy more often than SOs (38.5%). This difference reduced when organizations with policies under development were included (SOs 51.3% vs LOs 67.1%), with the differences not statistically significant (chi-square = 4.54, $df = 4$, $p > 0.1$). Still, many reported either a CGIT policy was lacking or they were unaware of one (SOs 48.7% vs LOs 33%).

**Table 4**
Views concerning the meaning of CGIT.

|                                                                                                                                                                                                                                                                          | SOs (%) | LOs (%) | Overall (%) |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|-------------|
| A responsibility of executives and the board of directors aimed at ensuring the organization's IT systems sustain and extend its strategies and objectives                                                                                                                 | 53.5    | 59      | 57.3        |
| A set of mechanisms to request, prioritize, sponsor, fund, monitor, and enforce IT investment decisions in order to ensure the resulting IT investments deliver value to the organization                                                                                   | 53.5    | 58      | 56.6        |
| A framework for decision rights and accountabilities designed to encourage desirable behavior in the use of IT within an organization                                                                                                                                      | 41.9    | 51      | 48.3        |
| The system by which the current and future use of IT is directed and controlled within an organization                                                                                                                                                                     | 39.5    | 41      | 40.6        |
| A subset of the overall corporate governance of the organization concerned specifically with decisions about key IT activities and investments                                                                                                                             | 41.9    | 50      | 47.6        |
| The strategic alignment of IT with business goals and objectives                                                                                                                                                                                                          | 51.2    | 44      | 46.2        |
| Others including (1) necessarily and sufficiently capable of managing and delivering the organization's ICT-enabled investment agenda and business continuity; (2) performance of and accountability for IT; (3) controls to ensure proper investment and management for IT capability; and (4) policies, strategies | 11.6    | 3       | 5.6         |

**Table 5**
CGIT policy, its formulation and communication ($n = 130$ comprising 39 SOs and 91 LOs).

| | SOs (%) | LOs (%) | Overall (%) |
|---|---|---|---|
| **Written CGIT policy** | | | |
| Yes standalone | 23.1 | 30.8 | 28.5 |
| Yes component of CG | 15.4 | 25.3 | 22.3 |
| Total yes | 38.5 | 56.1 | 50.8 |
| No but under development | 12.8 | 11 | 11.5 |
| No | 41 | 24.2 | 29.2 |
| Total no | 53.8 | 35.2 | 40.7 |
| Don't know | 7.7 | 8.8 | 8.5 |
| The next section excludes respondents who did not answer or answered "no" to having a written CGIT policy. Thus, $n = 81$ (20 SOs and 61 LOs) | | | |
| | | | |
| *Respondent involvement in developing a policy on CGIT* | | | |
| 1 (not) | 20 | 19.7 | 19.8 |
| 2 (a little) | 0 | 11.5 | 8.6 |
| Total (not and/or little) | 20 | 31.2 | 28.4 |
| 3 (moderately) | 15 | 16.4 | 16 |
| 4 (largely) | 15 | 11.5 | 12.3 |
| 5 (fully involved) | 50 | 37.7 | 40.7 |
| Total (largely and/or fully involved) | 65 | 49.2 | 53 |
| Other (standalone policy but no involvement) | | 3.3 | |
| Next, those who had a policy under development were excluded. Thus, $n = 66$ (15 SOs and 51 LOs) | | | |
| | | | |
| *Responsibility for updating it* | | | |
| CEO | 13.3 | 5.9 | 7.6 |
| CFO | 0 | 0 | 0 |
| COO | 0 | 2 | 1.5 |
| CIO | 40 | 56.9 | 53 |
| Board | 20 | 5.9 | 9.1 |
| Don't know | – | 11.8 | 9.1 |
| Other (including) | 26.7 | 13.7 | 16.7 |
| Missing data | | 3.9 | |
| | | | |
| *Responsibility for implementing it* | | | |
| CEO | 26.7 | 2 | 7.6 |
| CFO | 6.7 | 2 | 3 |
| COO | 0 | 5.9 | 4.5 |
| CIO | 20 | 58.8 | 50 |
| Board | 20 | 2 | 6.1 |
| Don't know | 6.7 | 9.8 | 9.1 |
| Other (i.e., executive team, advisory board, CIO + governance committee) | 20 | 15.7 | 16.7 |
| Missing data | | 3.9 | |
| | | | |
| *Frequency policy reviewed/updated* | | | |
| Monthly | 0 | 2 | 1.5 |
| 3 monthly | 13.3 | 15.7 | 15.2 |
| 6 monthly | 0 | 5.9 | 4.5 |
| Annually | 40 | 33.3 | 34.8 |
| Ad hoc | 46.7 | 19.6 | 25.8 |
| Don't know | 0 | 13.7 | 10.6 |
| Other (i.e., biennially, complex, too early to tell) | 0 | 5.9 | 4.5 |
| Missing data | | 3.9 | |
| | | | |
| *CGIT policy communicated* | | | |
| Yes | 66.7 | 64.7 | 65.2 |
| No | 33.3 | 19.6 | 22.7 |
| Don't know | 0 | 11.8 | 9.1 |
| Missing data | | 3.9 | |
| | | | |
| *Means of communicating CGIT policy* | | | |
| Email | 13.3 | 9.8 | 10.6 |
| Verbally by supervisor | 6.7 | 2 | 3 |
| Intranet | 20 | 35.3 | 31.8 |
| Internet | 6.7 | 0 | 1.5 |
| Other (i.e., all, email, many of the above, governance groups) | 6.7 | 5.9 | 6.1 |
| Missing data | 46.7 | 47.1 | 46.9 |

A total of 53% of respondents were involved with developing a CGIT policy. Some were "largely" involved (SOs 15% vs LOs 11.5%: Overall 12.3%); others more "fully" involved (SOs 50% vs LOs 37.7%: Overall 40.7%). Of those involved, the mean was 3.47 out of 5 (i.e., closer to being more involved), which was expected given the respondents' roles. Others' lack of involvement may be attributable to their job function (i.e., account manager, general manager—refer to Table 2).

We found that primary responsibility for updating CGIT policy resided with CIOs (SOs 40% vs LOs 56.9%: Overall 53%), with this more so for LOs than SOs. CEOs and Boards were more likely to be involved in SOs than LOs. Involvement in its implementation varied between CEOs (SOs 26.7% vs LOs 2%: Overall 7.6%) and CIOs (SOs 20% vs LOs 58.8%: Overall 50%). LOs influenced such results. There were low responses in the other categories where responsibility reportedly resided with IT executives (central government department, IT director, IT manager, and general manager—refer to Table 5). Interesting instances of group responsibility included advisory board, CIO + governance committee and IT manager + CEO. We found SOs' CGIT policies were reportedly updated mainly ad hoc (46.7%) vs LOs' annually (33.3%).

Policy communication is critical for ensuring employees understand their responsibilities. Overall, 31.8% (no: 22.7% + don't know: 9.1%) responded negatively about communication of CGIT policy. Intranets (SOs 20% vs LOs 35.3%: Overall 31.8%) then email (Overall 10.6%) were the primary communication tools. There was evidence about combined usage of many/all media (e.g., "email, newsletter, intranet and various governance groups", "meeting with CIO and via intranet").

### 4.3.2. Factors influencing organizations to develop CGIT-related policies

Respondents were asked to identify the top three influences for developing CGIT-related policies (RQ3, Part 2). With no pre-defined categories being provided, 54 responded (SOs 12, LOs 42) with many providing more than the requested three influences via double-barreled answers. Experts' initial thematic analysis revealed six distinct sources of influence: (1) those external to the organization; (2) those arising from business strategy and IT alignment; (3) governance; (4) leadership and management; (5) costs and resourcing; and (6) responses to a problem or issue.

In reviewing this independently derived analysis, we identified commonality with the five focus areas consistently identified by ITGI (2003, 2007) and ISACA (2012), namely, strategic alignment (business/IT), value delivery, resource management, risk management and performance measurement. Table 6 (see below) provides a description of each focus area and how respondents' answers align with these.

Regarding significant influences upon organizations to adopt a CGIT policy, both SOs and LOs identified need for corporate/IT strategic alignment and risk management. Beyond the evident synergies between these (i.e., risk may be an outcome of poor alignment), LOs' risk exposures have additional implications given organizational size, stakeholder numbers and legacy systems. The focus areas of value delivery and performance measurement were less influential: performance measurement being more important for SOs (16.9%) than for LOs (8.1%). Value delivery being relatively uninfluential (SOs 11.9% and LOs 9.7%) may be attributable to the difficulty of measuring IT value when it is absorbed into business processes (an outcome likely to be more complex for LOs). Further for LOs, value delivery appears to relate more to risk management as the identified influences include reducing complexity/standardization, ensuring projects are delivered on time and significant IT spend. Regarding resource management as an influence, comments related more to human than technical resources.

Overall, influential factors for CGIT policy development appear to relate to organizational foci on what IT could do for the organization (risk management and achieving alignment) rather than the organization's capacity to handle this IT initiative (resource management).

### 4.3.3. Benefits achieved from implementing a policy for CGIT

To gauge the principal benefits derived from implementing CGIT (RQ3, Part 3), respondents from organizations with a written CGIT policy were asked to indicate the extent to which their organization had achieved each of six generally recognized benefits (see Table 7). These were derived from the relevant literature (Wilkin and Chenhall, 2010; ISACA, 2012; ITGI, 2003). A total of 59 respondents (13 SOs and 46 LOs) answered on a five-point Likert scale ranging from 1 (not at all) to 5 (extensively). "Alignment of IT with business needs" was the most widely achieved benefit (mean = 3.66, SD[5] 0.94), as 64.5% of respondents had largely or extensively achieved this benefit—a claim made by 19 CIOs (SOs 4 vs LOs 15) and 8 IT Directors (LOs 8). Next was "Clarity of accountability among the organization's personnel" (mean 3.54, SD 1.02, 59.4%) where 15 CIOs (SOs 4 vs LOs 11), 6 CFOs (SOs 2 vs LOs 4) and 7 others (SOs 1 vs LOs 6) endorsed the benefit. "Clarity of responsibility among the organization's personnel" (mean 3.54, SD 0.97, 56%) was ranked third by 17 CIOs (SOs 5 vs LOs 12) and 6 IT Directors (SOs 1 vs LOs 5). Only 1 CEO and 1 COO answered the question (see Appendix 2). CFOs most valued clarity of accountability (SOs 2 vs LOs 4), followed by clarity of responsibility (SO 1 vs LOs 3). Findings suggest that CGIT's claimed benefits were largely achieved by the majority of organizations with a CGIT policy.

In terms of respondents claiming benefits as largely/extensively achieved from CGIT (n = 49), 26 respondents (SOs 6 vs LOs 20) had a standalone CGIT policy, 23 (SOs 5 vs LOs 18) had a CGIT policy as a component of CG, and 10 (SOs 2 vs LOs 8) had one under development (see Appendix 3). For these:

- The most widely realized benefit (38 respondents) was "Alignment of IT with business needs" comprising 18 (SOs 2 vs LOs 16) with a standalone policy; 13 (SOs 4 vs LOs 9) with a policy as a component of CG; and 7 (SOs 2 vs LOs 5) with a policy under development.
- "Clarifying accountability" was the next most widely realized benefit (35 respondents) comprising 15 (SOs 4 vs LOs 11); 12 (SOs 4 vs LOs 8); and 8 (SOs 2 vs LOs 6), respectively.
- "Clarifying responsibility" was next with 33 respondents comprising 20 (SOs 4 vs LOs 16); 9 (SOs 3 vs LOs 6); and 4 (SOs 2 vs LOs 2), respectively.
- "Improved stakeholder engagement" (29 respondents), "Cost savings from reduced liability due to risk management" (25 respondents), and "Efficient allocation of resources" (21 respondents) were achieved less.

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[5] SD = standard deviation.

**Table 6**
Factors influencing organizations to develop policies for CGIT.

| ITGI focus area | SOs | LOs |
|---|---|---|
| **Strategic alignment**<br>Concerns ensuring that IT is in harmony with an organization's strategic objectives, thereby providing capability to deliver business value by positioning IT to assist with adding value to products and/or services, and accordingly in achieving competitive position. Therefore business/IT alignment strategies should detail how all IT components (related to business processes, functionality, staffing and funding) are attuned to the organization's strategic direction | Identified as an influence 16 times (27%). Most cited influences:<br>• Ensure and oversee delivery of appropriate digital support (2);<br>• Business objectives and risk (2);<br>• Need to manage IT investment and value (2); and<br>• Support from executive team/focus leadership attention (2) | Identified as an influence 28 times (22.6%). Most cited influences:<br>• IT supports business direction (alignment) + IT treated as strategic by board (17); and equally:<br>• Innovation (2);<br>• Value adding (2);<br>• Improved business understanding (2);<br>• Good/best practice (2); and<br>• Business relationship management (2) |
| **Value delivery**<br>Concerns identifying IT benefits sought vs those achieved. This is difficult as determining IT/business value diminishes as IT functions are absorbed into business processes. Correct IT alignment delivers value through timely delivery of required IT capability with budgeted costs; and by supporting growth through new IT that facilitates business goals, i.e., improved resource capability, new market entry and revenue growth | Identified as an influence 7 times (11.9%). Most cited influences:<br>• As a small organization we need to manage IT investments to yield value (2) | Identified as an influence 12 times (9.7%). Most cited influences:<br>• Reducing complexity/standardization (4);<br>• Ensuring projects delivered on time (4); and<br>• Significant IT spend (3) |
| **Resource management**<br>Concerns resources (people, applications, data and technology that serve business needs) + the best financial allocation for IT investment and ongoing budgets, re: IT use/resources. Boards delegate to management through determining key responsibilities and accountability for decision-making. This requires determining skills to manage IT projects (or financial support to recruit/retain skilled people); oversight of plans, training and change management. Software licences, service contracts and human resources must be managed | Identified as an influence 8 times (13.6%). Most cited influences:<br>• Focus leadership attention/ support from IT executive team (2) | Identified as an influence 13 times (10.4%). Most cited influences:<br>• Poor practices (4); and<br>• CIO (2) |
| **Risk management**<br>Concerns financial and operational exposure including technological risk and information security, breakdowns in internal control and oversight, plus business vulnerability due to lack of protection for IT infrastructure. Risk awareness re: regulatory obligations, transparent determination of significant risks and associated risk avoidance policies/strategies are included. Responsibilities to management must include clear direction re constraints | Identified as an influence 18 times (30.5%). Most cited influences:<br>• Understanding IT Governance (2); and<br>• Corporate governance including as Advisory Organization (2) | Identified as an influence 61 times (49.2%). Most cited influences:<br>• Regulatory compliance (including external audit) (13);<br>• Risk management (including minimizing outages) (11); and equally<br>• Business relationship management (4); Good/best practice (4); Poor practices (4); and Poor IT performance (4) |
| **Performance measurement**<br>Involves measuring tangible assets with financial figures + intangible assets that often defy financial measurement (i.e., relationships, databases and knowledge assets). Hence customer retention, efficient processes and growing human resources should all be measured. One means is using a balanced scorecard for a more comprehensive view | Identified as an influence 10 times (16.9%). Influences included:<br>• Transparency across the organization;<br>• Overseeing IT direction; and<br>• Industry reports | Identified as an influence 10 times (8.1%), with ROI cited 8 times. Other influences:<br>• Ensuring results as promised to the board; and<br>• Visibility of returns on investment |

Of those who had a CGIT policy and who responded that they had largely/extensively achieved one or more of these 6 benefits, 5 (SOs 2 vs LOs 3) did not identify use of any of the 7 frameworks and methodologies referenced in Table 3. The rest (see Appendices 4 and 5) had implemented multiple frameworks/methodologies, with the average being 1.5 for SOs and 2.45 for LOs. Of these, ITIL was used by 35 respondents (SOs 5 vs LOs 30) as was Prince 2 (SOs 6 vs LOs 29), often together, i.e., 27 respondents (SOs 2 vs LOs 25). Regarding benefits achieved by those who had used these frameworks/methodologies and had a CGIT policy, 38 respondents (SOs 10 vs LOs 28) reported 3 or more benefits being largely/extensively achieved (4.4 being the average per SO and 3.5 the average per LO). The key benefits (see Appendices 4 and 5) reported as achieved by this group were "clarity of responsibility among the organization's personnel" by 33 respondents (SOs 9 vs LOs 24); "clarity of accountability" by 35 respondents (SOs 10 vs LOs 25); and "alignment of IT with business needs" by 38 respondents (SOs 8 vs LOs 30).

Comparing results for SOs and LOs revealed three statistically significant instances (at the 10% or 5% level), where the extent of achievement was higher for SOs than LOs: "cost savings" (means 3.69 vs 3.15 + $t = 1.76$, $df = 57$, $p < 0.1$); "clarity of accountability" (means 4.00 vs 3.41 + $t = 1.87$, $df = 57$, $p < 0.1$); and "efficient allocation of resources" (means 3.69 vs 2.98 + $t = 2.48$, $df = 57$, $p < 0.05$). Findings suggest that SOs' perceived benefits relate more to organizational efficiencies (cost, resource allocation, staff accountabilities). With the exception of IT alignment with business needs, SOs' perceived achievement of benefits was more positive than LOs'.

**Table 7**
Extent of achievement of benefits as a result of implementing a policy for CGIT.

| Benefit | Group | 1% (not at all) | 2% | 3% | 4% | 5% (extensively) | Combined, 4%/5% | Mean | SD |
|---|---|---|---|---|---|---|---|---|---|
| Improved engagement with stakeholders | SOs | 0 | 15.4 | 15.4 | 53.8 | 15.4 | 69.2 | 3.69 | 0.95 |
| | LOs | 4.3 | 15.2 | 37.0 | 32.6 | 10.9 | 43.5 | 3.30 | 1.00 |
| | Overall | 3.4 | 12.1 | 32.2 | 37.3 | 11.9 | 49.2 | 3.39 | 1.00 |
| Cost savings from reduced liability due to risk management | SOs | 0 | 15.4 | 15.4 | 53.8 | 15.4 | 69.2 | 3.69 | 0.95 |
| | LOs | 4.3 | 19.0 | 41.3 | 26.1 | 8.7 | 34.8 | 3.15 | 0.99 |
| | Overall | 3.4 | 18.6 | 35.6 | 32.2 | 10.2 | 42.4 | 3.27 | 1.00 |
| Clarity of responsibility among the organization's personnel | SOs | 0 | 15.4 | 15.4 | 38.5 | 30.8 | 69.3 | 3.85 | 1.07 |
| | LOs | 2.2 | 13.0 | 32.6 | 41.3 | 10.9 | 52.2 | 3.46 | 0.94 |
| | Overall | 1.7 | 13.6 | 28.8 | 40.7 | 15.3 | 56.0 | 3.54 | 0.97 |
| Clarity of accountability among the organization's personnel | SOs | 0 | 15.4 | 7.7 | 38.5 | 38.5 | 77.0 | 4.00 | 1.08 |
| | LOs | 4.3 | 13.0 | 28.3 | 45.7 | 8.7 | 54.4 | 3.41 | 0.98 |
| | Overall | 3.4 | 13.6 | 23.7 | 44.1 | 15.3 | 59.4 | 3.54 | 1.02 |
| Alignment of IT with business needs | SOs | 0 | 7.7 | 30.8 | 30.8 | 30.8 | 61.6 | 3.85 | 0.99 |
| | LOs | 4.3 | 6.5 | 23.9 | 54.3 | 10.9 | 65.2 | 3.61 | 0.93 |
| | Overall | 3.4 | 6.8 | 25.4 | 49.2 | 15.3 | 64.5 | 3.66 | 0.94 |
| Efficient allocation of resources | SOs | 0 | 15.4 | 23.1 | 38.5 | 23.1 | 61.6 | 3.69 | 1.03 |
| | LOs | 4.3 | 23.9 | 43.5 | 26.1 | 2.2 | 28.3 | 2.98 | 0.88 |
| | Overall | 3.4 | 22.0 | 39.0 | 28.8 | 6.8 | 35.6 | 3.14 | 0.96 |

#### 4.3.4. Challenges associated with CGIT

To investigate the relevance of previous research findings concerning challenges associated with implementing CGIT (*RQ3, Part 3*), we asked respondents to list their top three challenges.[6] We used an open-ended question that did not include pre-defined categories. In total, 95 responded (SOs 28 vs LOs 67), with many providing more than the requested three challenges via double-barreled answers. Our initial thematic analysis identified six categories: (1) ensuring CGIT knowledge and understanding; (2) resourcing; (3) building awareness, acceptance and compliance ("buy-in"); (4) roles of the executive and senior managers; (5) organizational culture and the change required; and (6) practical issues associated with CGIT implementation. As with influences (see Section 4.3.2), these responses related to ITGI's focus areas. The findings are summarized in Table 8.

In summary, we found that challenges concerned the human element. SOs and LOs both identified issues such as acceptance, commitment, executive buy-in, assigning accountabilities, communication and change management. For LOs, these challenges were reasonably consistent with their identified influences: alignment was important, with value delivery and performance measurement of lesser importance. Interestingly, resource management became most significant, particularly for *human resource* issues such as communication, resistance and training, and *technical* issues such as evaluating old IT, determining IT capability and managing outsourced/external providers. LOs identified issues with old IT including unwillingness to cede ownership, bureaucracy and ascertaining its real contribution.

SOs did not report the same concerns, possibly because their smaller size reduced the capacity to achieve opaqueness. Risk management was raised proportionately more often by SOs than by LOs, although SOs' risk issues related more to change management. Strategic alignment was raised more by LOs than SOs, but with similarity in their views: ensuring leadership commitment, managing change and appropriate planning being cited as key challenges. Value delivery was identified as a challenge, with both SOs and LOs acknowledging the difficulty of demonstrating benefits.

#### 4.3.5. Structures, processes, mechanisms and resources to support CGIT

Regardless of the presence of a formal policy, a series of questions explored how CGIT was supported (*RQ3, Part 4*), with respondents able to select multiple options (see Table 9 below). 90 respondents answered (SOs 25 vs LOs 65). The most common *structural mechanisms* for effective alignment of business and IT were: (1) IT steering committees (56.7%); (2) formal policies and procedures (50%), i.e., consistent with the findings reported in Section 4.3.1; (3) CIO role on the board (35.6%); and (4) IT strategy committee (34.4%). The only statistically significant difference between SOs and LOs concerned IT steering committees: (SOs 36% vs LOs 64.6% chi-square with continuity correction = 4.91, $df = 1$, $p < 0.05$, Fisher's exact test $p = 0.018$).

The most commonly *reported approach to enable CGIT* was service level agreements used by 64.4% of organizations. By contrast only 27.8% reported IT alignment models. There were no statistically significant differences between SOs and LOs here. *To facilitate commitment, involvement and communication*, regular briefings (66.7%) and business/IT collocation (55.6%) were favored with rewards and incentives used by some (17.8%). There were no significant differences between SOs and LOs regarding use of facilitation mechanisms.

Responses indicate that the largest proportion (41.1%) use online *training*. On-site training conducted internally (36.7%) was next with this the only statistically significant point of difference (SOs 56% vs LOs 29.2%). Findings show on average 1.4 training methods per organization being used. This reported low incidence of training warrants further investigation.

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[6] Idiosyncratic responses and challenges specific to particular organizations are not covered here.

**Table 8**
Challenges associated with CGIT.

| ITGI focus area | SOs | LOs |
|---|---|---|
| Strategic alignment | Identified as a challenge 18 times (23.7%). Most cited challenges:<br>• Change management whilst operating existing business (3);<br>• IT risks/risk management (3);<br>• Focus leadership attention (3); and<br>• Appropriate oversight and decision-making for risk management (2) | Identified as a challenge 96 times (33%). Most cited challenges:<br>• Ensuring/alignment the appropriate issues are being addressed (12);<br>• Appropriate business planning (12);<br>• Executive commitment (7);<br>• Shared understanding of benefits (5); and<br>• Balancing innovation and operations (5) |
| Value delivery | Identified as a challenge 4 times (5.3%). Most cited challenges:<br>• Value from IT/demonstrated benefits realization (3) | Identified as a challenge 7 times (2.4%). Most cited challenges:<br>• Value/cost (3); and<br>• Lack of maturity and understanding of benefits (2) |
| Resource management | Identified as a challenge 35 times (46%). Most cited challenges:<br>• Change management (5);<br>• Shared understanding of IT governance and benefits (2);<br>• Budget and resource allocation (2);<br>• Compliance of staff to policy (2);<br>• Internet security (2), i.e., cloud services, web;<br>• Maintaining currency (2); and<br>• Procuring software/cloud services (2) | Identified as a challenge 128 times (44%). Most cited challenges:<br>• Commitment (10);<br>• Acceptance (9);<br>• Communication (9);<br>• Managing resistance (7);<br>• Staff and user understanding (7); and<br>• Change management whilst operating existing business (5) |
| Risk management | Identified as a challenge 19 times (25%). Most cited challenges:<br>• Change management whilst operating existing business (3);<br>• IT risks/risk management (3);<br>• Appropriate oversight and decision-making for risk management (2); and<br>• Bring your own device (2) | Identified as a challenge 49 times (16.8%). Most cited challenges:<br>• Introducing a culture of accountability (6);<br>• Resistance, i.e., middle management, tenured staff (5);<br>• Enforcing compliance/governance (4);<br>• Integration of outsourced providers (3);<br>• Risk management vs commercial success (2);<br>• Risk taking ability among senior executives (2); and<br>• Inappropriate control by executives (2) |
| Performance measurement | Was not mentioned as a challenge | Identified as a challenge 11 times (3.8%). Most cited challenges:<br>• Demonstrated benefits realization (6);<br>• Audit, review (2); and<br>• Consequences re: non-compliance (2) |

Finally, when asked to estimate the proportion of annual turnover expended on CGIT, responses varied from 0% to 50% (with no statistically significant difference between SOs and LOs). Given the relationship between governance mechanisms and IT dependency (Héroux and Fortin, 2014), some organizations could be seriously under-investing in this critical area.

*4.4. ISO/IEC 38500:2008 principles in respondents' organizations*

To explore whether organizations were following ISO/IEC 38500:2008′s principles for CGIT (*RQ4*), we asked respondents to indicate their level of agreement with statements that captured the essence of this standard's six principles. On the basis of 94 responses (28 SOs and 66 LOs), it would appear that both SOs and LOs are following its principles. Of particular note, relatively few respondents disagreed with the statements (SOs 14.3%–32.2% vs LOs 9.1%–30.3%).

Strongest *agreement* (see Table 10) was with:

- *Principle 5*: "In my organization, IT complies with all mandatory legislation and regulations" (SOs 53.5% vs LOs 71.3%: Overall 62.4%). Enforceability of legislative requirements makes this result somewhat unsurprising, although differences are interesting.
- *Principle 1*: "Those with responsibility for actions have the authority to perform those actions" (SOs 57.2% vs LOs 65.1%: Overall 61.2%).
- *Principle 4*: "IT is fit for purpose in supporting my organization, in terms of providing the services, the levels of service and service quality required to meet the current and future business requirements" (SOs 63.4% vs LOs 51.5%: Overall 57.9%).

Strongest *disagreement* was with:

- *Principle 2*: "My organization's strategic plans for IT satisfy the current and ongoing needs of my organization's business strategy" (SOs 32.2% vs LOs 27.3%: Overall 29.8%).
- *Principle 4*: "IT is fit for purpose in supporting my organization, in terms of providing the services, the levels of service and service quality required to meet the current and future business requirements" (SOs 32.1% vs LOs 25.7%: Overall 28.9%). The principle attracted the most divergence as only 13.2% were neutral.
- *Principle 2*: "My organization's business strategy takes into account the future capabilities of IT" (SOs 32.1% vs LOs 24.2%: Overall 28.2%).

## 5. Discussion and research contributions

This study explored: (1) the extent of awareness and implementation of IT governance and management frameworks; (2) the practices, benefits, challenges and supporting mechanisms associated with the use of CGIT; and (3) whether there were differences between SOs and LOs in this regard. Theoretically, this perspective is relevant to organizational RBV if CGIT is perceived

**Table 9**
Structures, processes, mechanisms and resources to support CGIT.

| | | SOs (%) | LOs (%) | Overall (%) |
|---|---|---|---|---|
| Structural mechanism | CIO has a role on the board | 44.0 | 32.3 | 35.6 |
| | IT strategy committee | 44.0 | 30.8 | 34.4 |
| | Job specifications promote this | 36.0 | 32.3 | 31.3 |
| | IT steering committee | 36.0 | 64.6 | 56.7 |
| | Formal policies or procedures | 40.0 | 53.8 | 50.0 |
| | Others: CIO part of executive, alignment program, project governance group, portfolio governance communication… | 20.0 | 15.4 | 17.8 |
| Planning, implementation and monitoring approaches | Service level agreements | 60.0 | 66.2 | 64.4 |
| | Balanced scorecard | 24.0 | 41.5 | 36.7 |
| | Strategic information systems planning | 36.0 | 44.6 | 42.2 |
| | IT alignment models | 36.0 | 24.6 | 27.8 |
| | Other: none, weekly catch-up with general manager, informal only… | 24.0 | 15.4 | 18.9 |
| Facilitation mechanisms | Business/IT co-location | 64.0 | 52.3 | 55.6 |
| | Rewards and incentives | 12.0 | 20.0 | 17.8 |
| | Regular briefings | 72.0 | 64.6 | 66.7 |
| | Other: executive meetings, none, senior executive make up technology governance committee… | 20.0 | 12.3 | 15.6 |
| Training methods | Online training | 48.0 | 38.5 | 41.1 |
| | On-site training run by external providers | 12.0 | 13.8 | 13.3 |
| | On-site training run internally | 56.0 | 29.2 | 36.7 |
| | Off-site training run by external providers | 12.0 | 10.8 | 11.1 |
| | Other: advisors, briefings, email communication… | 24.0 | 40.0 | 36.7 |

**Table 10**
ISO/IEC 38500:2008's principles in respondents' organizations.

| | | Group | Disagree (%) | Neutral (%) | Agree (%) | Mean | SD |
|---|---|---|---|---|---|---|---|
| Principle 1: Responsibility | Individuals and groups within my organization understand and accept their responsibilities with respect to *demand for IT* | SOs | 21.4 | 17.9 | 60.7 | 3.36 | 1.22 |
| | | LOs | 30.3 | 21.2 | 48.5 | 3.20 | 0.95 |
| | | Overall | 25.6 | 19.6 | 54.6 | 3.24 | 1.03 |
| | Individuals and groups within my organization understand and accept their responsibility with respect to the *supply of IT* | SOs | 21.4 | 17.9 | 60.7 | 3.39 | 1.26 |
| | | LOs | 18.2 | 28.8 | 53 | 3.33 | 0.87 |
| | | Overall | 19.8 | 23.4 | 56.9 | 3.35 | 0.99 |
| | Those with responsibility for actions have the authority to perform those actions | SOs | 25 | 17.9 | 57.2 | 3.46 | 1.40 |
| | | LOs | 13.6 | 21.2 | 65.1 | 3.56 | 0.79 |
| | | Overall | 19.3 | 19.6 | 61.2 | 3.53 | 1.00 |
| Principle 2: Strategy | My organization's business strategy takes into account the current capabilities of IT | SOs | 28.6 | 10.7 | 60.7 | 3.39 | 1.37 |
| | | LOs | 25.8 | 24.2 | 50 | 3.36 | 1.00 |
| | | Overall | 27.2 | 17.5 | 55.4 | 3.37 | 1.12 |
| | My organization's business strategy takes into account the future capabilities of IT | SOs | 32.1 | 25 | 42.8 | 2.96 | 1.37 |
| | | LOs | 24.2 | 30.3 | 45.5 | 3.29 | 0.92 |
| | | Overall | 28.2 | 27.7 | 44.2 | 3.19 | 1.08 |
| | My organization's strategic plans for IT satisfy the current and ongoing needs of my organization's business strategy | SOs | 32.2 | 14.3 | 53.6 | 3.14 | 1.33 |
| | | LOs | 27.3 | 24.2 | 48.5 | 3.29 | 1.00 |
| | | Overall | 29.8 | 19.3 | 51.1 | 3.24 | 1.10 |
| Principle 3: Acquisition | IT acquisitions are made on the basis of appropriate and ongoing analysis, with clear and transparent decision-making | SOs | 25 | 21.4 | 53.6 | 3.32 | 1.31 |
| | | LOs | 25.8 | 16.7 | 57.6 | 3.35 | 1.09 |
| | | Overall | 25.4 | 19.1 | 55.6 | 3.34 | 1.15 |
| | When we make IT acquisition decisions, an appropriate balance is achieved between benefits, opportunities, costs and risks | SOs | 21.4 | 25 | 53.6 | 3.36 | 1.19 |
| | | LOs | 24.2 | 21.2 | 54.6 | 3.42 | 1.08 |
| | | Overall | 22.8 | 23.1 | 54.1 | 3.40 | 1.11 |
| Principle 4: Performance | IT is fit for purpose in supporting my organization, in terms of providing the services, the levels of service and service quality required to meet the current and future business requirements | SOs | 32.1 | 3.6 | 64.3 | 3.39 | 1.32 |
| | | LOs | 25.7 | 22.7 | 51.5 | 3.32 | 1.03 |
| | | Overall | 28.9 | 13.2 | 57.9 | 3.34 | 1.11 |
| Principle 5: Conformance | In my organization, IT complies with all mandatory legislation and regulations | SOs | 14.3 | 32.1 | 53.5 | 3.50 | 1.20 |
| | | LOs | 9.1 | 19.7 | 71.3 | 3.77 | 0.82 |
| | | Overall | 11.7 | 25.9 | 62.4 | 3.69 | 0.95 |
| | In my organization, IT-related policies and practices are clearly defined, implemented and enforced | SOs | 32.2 | 21.4 | 46.5 | 3.18 | 1.34 |
| | | LOs | 22.7 | 33.3 | 44 | 3.24 | 0.99 |
| | | Overall | 27.5 | 27.4 | 45.3 | 3.22 | 1.10 |
| Principle 6: Human behavior | In my organization, IT policies, practices and decisions demonstrate respect for human behavior, including the current and evolving needs of all "people in the process | SOs | 17.9 | 28.6 | 53.6 | 3.29 | 1.24 |
| | | LOs | 15.1 | 37.9 | 47 | 3.36 | 0.85 |
| | | Overall | 16.5 | 33.3 | 50.3 | 3.34 | 0.98 |

as being a distinctive capability that facilitates linkage of intangible assets (i.e., people, commitment and resource complementarity) with tangible assets (i.e., IT functionality) to deliver improved organization performance (Weingarten et al., 2013; Weill and Olson, 1989) and hence sustainable competitive advantage.

Next, we discuss (see below) how our findings demonstrate CGIT's relationship to organizational performance.

*CGIT practices (RQ1).* Findings show that implementation was associated with project management tools (Prince 2 and ITIL) rather than governance and management frameworks (COBIT, Val IT and Risk IT), which had reasonable levels of awareness. Given 30.1% of respondents were CIOs, such findings may reflect a background in project management. Despite awareness of COSO (37.1%), there was little acknowledgement of its use (6.3%).

*CGIT's meaning (RQ2)* was generally found to relate to definitions concerned with delivering value through strategic and inclusive practices such as defining accountabilities, with differences related to organizational size being most apparent for the option that included reference to corporate governance.

*Concerning CGIT policy (RQ3, Part1),* LOs were more proactive in having written policy: SOs were more likely not to have a policy (SOs 41% vs LOs 24.2%).

*Regarding factors influencing adoption of CGIT policies (RQ3, Part 2),* qualitative analysis suggests both SOs and LOs saw risk management as the most important influence. For LOs, it relates more to regulatory compliance, audit, minimizing IT downtime and poor IT performance: for SOs, it relates more to process. Further, both saw IT strategic alignment with business objectives as a primary influence, and in line with the RBV, identified this as important to value delivery.

Interestingly, the terminology from SOs relates more to internal organizational perspectives, with words such as "we" and "need". There was less of the external outcomes/governance jargon employed by LOs, i.e., "policy", "regulatory", "align", "ROI" and "compliance". Consonant with the perspective of SOs' resource constraints, SOs may be more engaged with delivering the practicalities than the formalities.

*Concerning CGIT benefits (RQ3, Part 3),* SOs and LOs both indicated alignment as a key benefit, i.e., by delivering a distinctive capability for improved organizational performance, CGIT was regarded as beneficial to delivering RBV. For those with written CGIT policies, key reported benefits were: (1) alignment of IT with business needs; (2) clarity of accountability and of responsibility among personnel; and (3) improved stakeholder engagement. Given the least liked definition concerned control, it is surprising that the most popular benefit from implementing CGIT was clarity of accountability, followed by clarity of responsibility. This must be linked to findings regarding structures, processes, mechanisms and resources (where emphasis related to governing action rather than people, i.e., planning, implementing, and monitoring, as well as facilitation mechanisms). This focus is consistent with human resources being perceived as a challenge for CGIT to deliver RBV.

*In reporting challenges with implementing CGIT (RQ3, Part 3),* the human element was a primary challenge. Regardless of organizational size, challenges involved: (1) ensuring an understanding of CGIT and its benefits necessary to achieve the required stakeholder buy-in (apparently a lesser problem for SOs); (2) achieving strategic alignment of IT with business goals and strategies; and (3) ensuring organizational capability to enable CGIT implementation. LOs' challenges involved concepts more relevant to more bureaucratic organizations, i.e., corporate levels, business model, and stakeholders. Further, LOs saw emergent themes as managing organizational change and understanding the value offered by CGIT. Resource management was regarded as a significant challenge for both SOs and LOs (see Table 8), with resource-constrained SOs seeing this in practical terms such as training, a lack of critical resources and leadership capability.

*Mechanisms for supporting CGIT (RQ3, Part 4)* at a strategic level involved formal roles including IT steering and/or strategy committees and formal policies. Related to this, the mechanisms tended to focus on defining/clarifying accountabilities.

There was general agreement about *the applicability of* ISO/IEC 38500:2008 *to CGIT delivery (RQ4).* Both SOs and LOs reported that they delivered on Principles 5 (Conformance), 1 (Responsibility) and 4 (Performance), but equally had problems (% disagree) with two aspects of Principle 2 (Strategy), and Principle 4 (Performance). Regarding Principle 1, assigned authorities were reportedly effected but with less acceptance in LOs than SOs. Both LOs and SOs acknowledged delivering on assigned accountabilities as being significant, an issue affecting the delivery of organizational capability. Further, approximately 55.8% of respondents indicated a need for organizational improvement regarding how business strategies take future IT capabilities into account (Principle 2 *Strategy*). Similarly, for Principle 5 (Conformance), there was agreement about meeting regulatory requirements (62.4%), with acknowledgement that internal governance policies and practices were less well effected (45.3%). Only 57.9% (SOs 51.5% and LOs 64.3%) agreed that their organization's IT delivered on current and future business requirements (i.e., Principle 4, *Performance*).

As IT has become integral to enacting business strategy and processes (Chaudhuri, 2011), organizations have recognized CGIT's importance. Research has focused on CGIT delivering RBV through IT alignment with business objectives and improved IT capability (i.e., Wu et al., 2015; Prasad et al., 2012; Lunardi et al., 2014). Our findings contribute knowledge that besides such alignment, risk management is a key influence. Of these two influences, LOs saw risk management as considerably more important (for SOs only marginally so). Alternatively, alignment was identified as a primary benefit from CGIT adoption. However, endorsement of clarified accountabilities and responsibilities, and improved stakeholder engagement, recognize the importance of effective delivery (and risk management). Resource management was identified as a primary challenge (SOs 46% and LOs 44%). Findings that ISO/IEC 38500:2008's Principle 2 (*Strategy*) had the weakest mean scores, particularly concerning organizational strategy accounting for future IT capability, suggest immediate rather than strategic foci. Finally, both SOs and LOs indicated stronger interest in IT acquisitions being fit for purpose and agreement about the need to balance benefits and risk (Principle 3, Parts 1 and 2, respectively).

Findings that CGIT was top-down driven are evident in the emphasis on written policy, as well as LOs' and SOs' identification of resource management as a primary challenge. Weak agreement for Principle 5 (CGIT policies being clearly identified, implemented, and enforced) supports this conclusion. Again reported structures, processes, mechanisms and resources show reliance

on formal mechanisms (IT steering committees, formal policies, service level agreements, strategic planning and briefing)—it was SOs who were more inclusive with considerably more bottom-up focus on training.

The study's limitations create opportunities for future research. For example, our sample was not random and the sample size not large. This self-selection bias and our respondents being primarily from organizations with headquarters in Australia (83.9%), mean that findings cannot be generalized to the population. Hence further research involving other countries is warranted, i.e., a comparative study with other Asia-Pacific countries vs those in the United States or Europe. Further, the survey captures primarily perceptive information, which imposes some limitations on the derived conclusions as this form of data collection has some susceptibility to bias and error. Follow-up interviews with different stakeholder groups would strengthen the conclusions.

## 6. Conclusion

Given that SOs are widely regarded as having an operational rather than strategic focus, the extent of SOs' engagement with CGIT and their primary focus on alignment constitutes new knowledge about their governance rather than simply management focus on IT to achieve RBV. Whilst acknowledging the limitation of our sample size, findings reveal human engagement with CGIT as a primary source of challenge for SOs and LOs, with responsibilities managed in terms of assigned responsibility and commitment rather than control. In contrast to prior research's findings of IT strategic alignment with business objectives being a primary factor in delivering IT value through CGIT, this research provides some indication of the importance of risk management as an influence. This was regardless of organizational size.

In general, our findings demonstrate that the surveyed LOs and SOs acknowledge CGIT as a capability by which to enhance RBV, with alignment and risk management both being significant factors. We find that acknowledged areas for improved CGIT practice include more attention on actioning policy through better delivery on assigned accountabilities and attention to human resource issues, including as this relates to change management. Of particular interest is our identified lack of significant differences in key indicators between SOs and LOs. This contributes new knowledge about smaller organizations' engagement with CGIT to generate business value in ways comparable with those of their large counterparts.

## Acknowledgements

## Appendix 1. Sources of definitive statements regarding CGIT's meaning (related to Table 4)

| Definitive statement | Source | Details |
|---|---|---|
| A responsibility of executives and the board of directors aimed at ensuring the organization's IT systems sustain and extend its strategies and objectives | Adapted from ITGI (2007 p. 5) | Actual words "IT governance is the responsibility of executives and the board of directors, and consists of the leadership, organizational structures and processes that ensure that the enterprise's IT sustains and extend the organization's strategies and objectives" |
| A set of mechanisms to request, prioritize, sponsor, fund, monitor, and enforce IT investment decisions in order to ensure the resulting IT investments deliver value to the organization | Adapted from Heier et al. (2009 p. 1) | Actual words "Congruent with Korac-Kakabadse and Kakabadse (2001), as well as with Weill and Vitale (2002), we define IT governance as the set of enabling mechanisms to request, prioritize, fund, monitor, enforce, and realign IT investment decisions" |
| A framework for decision rights and accountabilities designed to encourage desirable behavior in the use of IT within an organization | Adapted from Weill and Ross, (2004 p. 1) and Weill (2004 p. 3) | Actual words "IT governance is the decision rights and accountability framework for encouraging desirable behaviors in the use of IT" |
| The system by which the current and future use of IT is directed and controlled within an organization | ISO/IEC 38500:2008 (p. 3) | Actual words |
| A subset of the overall corporate governance of the organization concerned specifically with decisions about key IT activities and investments | Adapted from Debreceny and Gray (2013) | Actual words "In broad terms, IT governance is the exercise of decision rights, as a subset of corporate governance, and the design and execution of structures and processes to manage risk and implement organizational objectives" |
| The strategic alignment of IT with business goals and objectives | Adapted from Van Grembergen et al. (2005) and Mueller and Phillipson (2007) | Van Grembergen et al. (2005 p. 1) "a crucial element of IT governance is achieving a better link between business and IT, also referred to as strategic alignment" and "Good IT governance is a strategic enabling force of your business" Mueller and Phillipson (2007 p. 1) |
| Others including: (1) necessarily and sufficiently capable of managing and delivering the organization's ICT-enabled investment agenda and business continuity; (2) performance of and accountability for IT; (3) controls to ensure proper investment and management for IT capability; and (4) policies, strategies | Adapted from Government ICT Strategy (2011); AS 8015:2005; Cater-Steel (2008); Weill and Ross (2005); Moeller (2013); ISO 38500:2008. | |

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## Appendix 2. Breakdown of benefits according to respondents' position for those who have implemented a CGIT policy and who report that benefits are largely/extensively achieved (4/5)*

| Benefit | Group | Combined 4/5 | CEO | CIO | IT Director | COO | CFO | Other |
|---|---|---|---|---|---|---|---|---|
| Improved engagement with stakeholders | SOs | 69.2% | 1 | 5 | 1 | 0 | 1 | 1 |
| | LOs | 43.5% | 0 | 13 | 3 | 0 | 2 | 2 |
| | Overall | 49.2% | 1 | 18 | 4 | 0 | 3 | 3 |
| Cost savings from reduced liability due to risk management | SOs | 69.2% | 1 | 4 | 1 | 0 | 1 | 2 |
| | LOs | 34.8% | 0 | 9 | 3 | 0 | 2 | 2 |
| | Overall | 42.4% | 1 | 13 | 4 | 0 | 3 | 4 |
| Clarity of responsibility among the organization's personnel | SOs | 69.3% | 1 | 5 | 1 | 1 | 1 | 0 |
| | LOs | 52.2% | 0 | 12 | 5 | 0 | 3 | 4 |
| | Overall | 56.0% | 1 | 17 | 6 | 1 | 4 | 4 |
| Clarity of accountability among the organization's personnel | SOs | 77.0% | 1 | 4 | 1 | 1 | 2 | 1 |
| | LOs | 54.4% | 0 | 11 | 4 | 0 | 4 | 6 |
| | Overall | 59.4% | 1 | 15 | 5 | 1 | 6 | 7 |
| Alignment of IT with business needs | SOs | 61.6% | 1 | 4 | 0 | 1 | 1 | 1 |
| | LOs | 65.2% | 0 | 15 | 8 | 0 | 2 | 5 |
| | Overall | 64.5% | 1 | 19 | 8 | 1 | 3 | 6 |
| Efficient allocation of resources | SOs | 61.6% | 1 | 3 | 1 | 0 | 2 | 1 |
| | LOs | 28.3% | 0 | 7 | 3 | 0 | 1 | 2 |
| | Overall | 35.6% | 1 | 10 | 4 | 0 | 3 | 3 |

*Note that to answer this question, respondents had to have a CGIT policy or one under development.

## Appendix 3. Breakdown of benefits according to the level of implementation of a CGIT policy for those who report that benefits are largely/extensively achieved (4/5)*

| Benefit | Group | Combined, 4/5 | Standalone CGIT policy | CGIT policy component of CG | CGIT policy under development |
|---|---|---|---|---|---|
| Improved engagement with stakeholders | SOs | 69.2% | 4 | 4 | 1 |
| | LOs | 43.5% | 12 | 6 | 2 |
| | Overall | 49.2% | 16 | 10 | 3 |
| Cost savings from reduced liability due to risk management | SOs | 69.2% | 3 | 5 | 1 |
| | LOs | 34.8% | 9 | 6 | 1 |
| | Overall | 42.4% | 12 | 11 | 2 |
| Clarity of responsibility among the organization's personnel | SOs | 69.3% | 4 | 3 | 2 |
| | LOs | 52.2% | 16 | 6 | 2 |
| | Overall | 56.0% | 20 | 9 | 4 |

**Appendix 3** *(continued)*

| Benefit | Group | Combined, 4/5 | Standalone CGIT policy | CGIT policy component of CG | CGIT policy under development |
|---|---|---|---|---|---|
| Clarity of accountability among the organization's personnel | SOs | 77.0% | 4 | 4 | 2 |
| | LOs | 54.4% | 11 | 8 | 6 |
| | Overall | 59.4% | 15 | 12 | 8 |
| Alignment of IT with business needs | SOs | 61.6% | 2 | 4 | 2 |
| | LOs | 65.2% | 16 | 9 | 5 |
| | Overall | 64.5% | 18 | 13 | 7 |
| Efficient allocation of resources | SOs | 61.6% | 4 | 3 | 1 |
| | LOs | 28.3% | 7 | 4 | 2 |
| | Overall | 35.6% | 11 | 7 | 3 |

*Note that to answer this question, respondents had to have a CGIT policy or one under development.

**Appendix 4. Breakdown of benefits according to the number of frameworks implemented (see Tables 1, 3 and 7 for details) for those who report that benefits are largely/extensively achieved (4/5)**

| Benefit | Group | Combined, 4/5 | No reporting the benefit | Achieved by implementing… | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 0 frameworks or methodologies | 1 framework or methodology | 2 frameworks or methodologies | 3 frameworks or methodologies | 3+ frameworks or methodologies |
| Improved engagement with stakeholders | SOs | 69.2% | 9 | 2 | 3 | 2 | 2 | 0 |
| | LOs | 43.5% | 20 | 3 | 4 | 5 | 2 | 6 |
| | Overall | 49.2% | 29 | 5 | 7 | 7 | 4 | 6 |
| Cost savings from reduced liability due to risk management | SOs | 69.2% | 9 | 2 | 1 | 3 | 3 | 0 |
| | LOs | 34.8% | 16 | 0 | 5 | 7 | 1 | 3 |
| | Overall | 42.4% | 25 | 2 | 6 | 10 | 4 | 3 |
| Clarity of responsibility among the organization's personnel | SOs | 69.3% | 9 | 2 | 3 | 2 | 2 | 0 |
| | LOs | 52.2% | 24 | 1 | 6 | 9 | 3 | 5 |
| | Overall | 56.0% | 33 | 3 | 9 | 11 | 5 | 5 |
| Clarity of accountability among the organization's personnel | SOs | 77.0% | 10 | 2 | 3 | 2 | 3 | 0 |
| | LOs | 54.4% | 25 | 2 | 6 | 9 | 3 | 5 |
| | Overall | 59.4% | 35 | 4 | 9 | 11 | 6 | 5 |
| Alignment of IT with business needs | SOs | 61.6% | 8 | 2 | 1 | 2 | 3 | 0 |
| | LOs | 65.2% | 30 | 2 | 7 | 11 | 4 | 6 |
| | Overall | 64.5% | 38 | 4 | 8 | 13 | 7 | 6 |
| Efficient allocation of resources | SOs | 61.6% | 8 | 3 | 1 | 1 | 3 | 0 |
| | LOs | 28.3% | 13 | 0 | 2 | 7 | 2 | 2 |
| | Overall | 35.6% | 21 | 3 | 3 | 8 | 5 | 2 |

*Note that to answer this question, respondents had to have a CGIT policy or one under development.

**Appendix 5. Breakdown of benefits according to a specific framework implemented (see Tables 1, 3 and 7 for details) for those who report that benefits are largely/extensively achieved (4/5)**

| Benefit | Group | Combined, 4/5 | Total | Val IT | COBIT | Risk IT | ITIL | CMMI | Prince 2 | COSO | None used |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Improved engagement with stakeholders | SOs | 69.2% | 15 | 0 | 0 | 2 | 4 | 2 | 4 | 1 | 2 |
| | LOs | 43.5% | 54 | 2 | 7 | 4 | 17 | 7 | 14 | 2 | 1 |
| | Overall | 49.2% | 69 | 2 | 7 | 6 | 21 | 9 | 18 | 3 | 3 |
| Cost savings from reduced liability due to risk management | SOs | 69.2% | 17 | 1 | 0 | 3 | 4 | 2 | 4 | 1 | 2 |
| | LOs | 34.8% | 39 | 1 | 4 | 3 | 15 | 3 | 11 | 2 | 0 |
| | Overall | 42.4% | 56 | 2 | 4 | 6 | 19 | 5 | 15 | 3 | 2 |
| Clarity of responsibility among the organization's personnel | SOs | 69.3% | 15 | 0 | 0 | 2 | 5 | 1 | 4 | 1 | 2 |
| | LOs | 52.2% | 60 | 1 | 6 | 4 | 21 | 6 | 18 | 3 | 1 |
| | Overall | 56.0% | 75 | 1 | 6 | 6 | 26 | 7 | 22 | 4 | 3 |
| Clarity of accountability among the organization's personnel | SOs | 77.0% | 18 | 1 | 0 | 3 | 5 | 1 | 5 | 1 | 2 |
| | LOs | 54.4% | 64 | 2 | 6 | 5 | 20 | 6 | 19 | 4 | 2 |
| | Overall | 59.4% | 82 | 3 | 6 | 8 | 25 | 7 | 24 | 5 | 4 |
| Alignment of IT with business needs | SOs | 61.6% | 16 | 1 | 0 | 3 | 4 | 1 | 4 | 1 | 2 |
| | LOs | 65.2% | 70 | 0 | 7 | 4 | 24 | 7 | 24 | 2 | 2 |
| | Overall | 64.5% | 86 | 1 | 7 | 7 | 28 | 8 | 28 | 3 | 4 |
| Efficient allocation of resources | SOs | 61.6% | 15 | 1 | 0 | 3 | 4 | 1 | 2 | 1 | 3 |
| | LOs | 28.3% | 31 | 0 | 2 | 1 | 12 | 3 | 12 | 1 | 0 |
| | Overall | 35.6% | 46 | 1 | 2 | 4 | 16 | 4 | 14 | 2 | 3 |

*Note that to answer this question, respondents had to have a CGIT policy or one under development.

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