

A Survey of Information Technology Governance Capability in Five Jurisdictions Using the ISO 38500:2008 Framework

Shafi Mohamad and Mark Toomey

Abstract

This survey comparing IT governance capability against the international standard ISO 38500:2008 Corporate governance of information technology was carried out separately in five jurisdictions Argentina, El Salvador, Malaysia, Oman and United Arab Emirates(UAE) and attempts to position ISO 38500 and the key concepts for governance of IT in the 21st century. The findings of the survey may then be used to inform organizational policies, procedures, and practices that will hopefully lead to the development of sustainable business practices through responsible IT governance that reflect the interests of all stakeholders. The survey is significant given the current global trend of outsourcing, cloud computing, e-business and IT economy as well as the increasingly dominant roles that IT plays in helping organizations improve the efficiency and productivity of their business. The survey should assist board directors and senior managers to formulate and implement effective strategies to align and integrate technology, operations, strategies, structures, culture, and human resources in IT governance. The findings should hopefully provide a greater understanding of the important issues involved in IT governance and management within industry and business contexts.

Keywords: IT Governance, ISO38500:2008, jurisdictions, sustainable, stakeholders.

Shafi Mohamad (s.mohamad@griffith.edu.au) is presently a PhD Candidate at Griffith University. Prior to this he was an Associate Professor of Accountancy at Universiti Teknologi Mara in Malaysia.

Mark Toomey (mtoomey@infonomics.com.au) is Managing Director at Infonomics Pty Ltd., Melbourne, Australia. He was the original ISO Project Editor for ISO/IEC 38500 and is widely regarded as an international authority on its use.

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1.0 INTRODUCTION

IT systems are becoming increasingly indispensable for organisations in their daily operations (Van Grembergen, De Haes & Guldentops, 2004; Bart & Turel, 2009; Parent & Reich, 2009; De Haes and Van Grembergen, 2009). As a result, organisations invest considerable capital into IT assets to support the IT needs of their employees and other stakeholders resulting in spending on corporate information assets accounting for more than 50% of capital outlay (Nolan & McFarlan, 2005, p.96). With more and more business being transacted online via the internet, IT dependent business transactions and capital expenditure on IT software, hardware and infrastructure is expected to continue to grow rapidly. Maintenance costs are also expected to continue to rise due to increased costs associated with power, storage, and staffing. In short, the contemporary global business environment is increasingly reliant on IT, which in turn needs to be governed effectively and efficiently.

The advent of cloud computing is challenging some of these predictions, but is at the same time enabling accelerated take-up of IT by business, with simultaneous dispersion of control into the business user arena, enabling non-IT professionals to make significant decisions about the use of IT. This emergent behaviour places significant additional stress on the systems that organisations use to direct and control their use of IT. New models for governance and management of IT are necessary (Livingstone 2011).

While dependence on technology is increasing, numerous studies (KPMG, 2005, Standish Group 1994) and failures frequently reported in the general press such as the UK National Health Service National Program for IT, the Australian Customs Imports Control System, Queensland Health Payroll, New Zealand Ministry of Education Payroll and many more cases confirm that there remains significant risk that organisations investing in and operationally dependent on IT are at risk of damaging impact from failure of IT investments and operational IT systems. Despite widespread and substantial investment in new management systems based on guidance in published and widely available frameworks, organisations are manifestly at risk of IT failures. South Africa's Department of Public Service Administration (DPSA) (2012) found, through audits in 2008/9, 2009/10 and 2010/11, that attempts to implement effective control over IT investments had failed to secure proper engagement of the political and executive leadership of departments and was being inappropriately delegated to technical specialists.

IT capability is directly related to the long term consequences of decisions made by top management. Traditionally, board-level executives deferred key IT decisions to the company's IT professionals. This cannot ensure the best interests of all stakeholders unless deliberate action involves all stakeholders. IT governance systematically involves everyone: board members, executive management, staff and customers. It establishes the framework used by the organization to establish transparent accountability of individual decisions, and ensures the traceability of decisions to assigned responsibilities.

Is IT governance different from IT management and IT controls? The problem with IT governance is that often it is confused with good management practices and IT control frameworks. ISO 38500:2008 has helped clarify IT governance by describing it as the overarching system for directing and controlling IT used by directors. In other words, IT governance is about the stewardship of IT resources on behalf of the stakeholders who expect a return from their investment. The directors responsible for this stewardship will look to the management to implement the necessary management systems and IT controls. Toomey (2009), who was also the ISO Project Editor for ISO 38500, explains that Governance and Management of IT are separate, but related concepts, where the management aspects are frequently and incorrectly referred to as “IT Governance” in established management frameworks such as COBIT and ITIL and management system standards such as ISO 20000 and ISO 27000. Management activity typically involves processes and organisation structures as are set out in COBIT, ITIL and is subject to direction, control and monitoring by the governing body as described in ISO 38500. South Africa’s Department of Public Service Administration (DPSA) notes that COBIT is not a standard – it is a process framework within which a department has flexibility regarding implementation, according to its specific environmental context. DPSA is implementing, throughout the South African government, an approach to governance of IT that is framed using ISO 38500 and then uses COBIT to inform design of the process elements of the underpinning management systems.

Whilst managing risk and ensuring compliance are essential components of good governance, it is more important to be focused on delivering value and measuring performance. Less than a quarter of all enterprises have adopted any major IT governance standard despite the potential benefits to performance and profitability according to a study conducted by the global technology giant Dell. While different companies have different reasons, the failure is often a reflection of the belief that IT governance standards are too expensive to implement, that they don’t reflect reality, or that it is unnecessary if they have already reached compliance with Sarbanes-Oxley (SOX) and other legislative and regulatory requirements. However, the benefits that can be achieved by following the best practices should outweigh these perceived issues.

Today’s leading companies embrace information technology not as a means of cost-cutting, but as a tool for generating innovation, business success, and sustainability. Innovation is viewed as an essential element in the entrepreneurial process (Schaper & Volery, 2003) and creates benefits to the organization, which often manifest themselves in an economy’s wealth creation. Innovation is linked to knowledge and learning and is frequently viewed as an organization’s capability, knowledge asset and resource, which, in a global marketplace, provide new platforms for competitive advantage that others find difficult to replicate (McMurray & Dorai, 2003).

Studies show that the key success factor of information technology (IT) use is strongly linked to effectiveness of IT governance (Toomey, 2006). The IT literature is predominantly focused on outcomes addressing tangibles such as key performance indicators and innovation. International competitiveness, innovation capacity, and sustainability of industry and business are significantly influenced by the ability to develop and harness the power of IT. While IT has created abundant business opportunities, it has also rendered many traditional business management models obsolete. For example, IT requires digital transformation and profound changes in corporate governance, organizational internal and external business structure, including strategy (Zhao, 2006) and furthermore require an organizational culture embracing such values, attitudes, and beliefs to become embedded in and move across traditional organizational boundaries (McMurray, Cross, & Caponecchia, 2007).

The primary goals for information technology governance are to (1) assure that the investments in IT generate business value, and (2) mitigate the risks that are associated with IT. This can be done by implementing an organizational structure with well-defined roles for the responsibility of information, business processes, applications, IT infrastructure, etc.

This survey comparing IT governance capability against the international standard ISO 38500:2008 Corporate governance of information technology was carried out separately in five jurisdictions Argentina, El Salvador, Malaysia, Oman and United Arab Emirates(UAE) and attempts to position ISO 38500 and the key concepts for governance of IT in the 21st century. The findings of the survey may then be used to inform organizational policies, procedures, and practices that will hopefully lead to the development of sustainable business practices through responsible IT governance that reflect the interests of all stakeholders. The survey is significant given the current global trend of outsourcing, cloud computing, e-business and IT economy as well as the increasingly dominant roles that IT plays in helping organizations improve the efficiency and productivity of their business. The survey should assist board directors and senior managers to formulate and implement effective strategies to align and integrate technology, operations, strategies, structures, culture, and human resources in IT governance. The findings should hopefully provide a greater understanding of the important issues involved in IT governance and management within industry and business contexts.

2.0 LITERATURE REVIEW

2.1 IT Governance Definition Issues

IT Governance(ITG) can be defined either broadly or more narrowly. For instance, Weill and Ross(2004) focus on *"specifying the decision rights and accountability framework to encourage desirable behavior in the use of IT."* On the otherhand Van Grembergen and De Haes (2009) focus on enterprise governance of IT and define this as *"an integral part of corporate governance and addresses the definition and implementation of processes, structures and relational mechanisms in the organization that enable both business and IT people to execute their responsibilities in support of business/IT alignment and the creation of business value from IT enabled investments"*. Meanwhile IT governance is defined by the International Standard for Corporate governance of information technology (ISO/IEC 38500) as *"the system by which the current and future use of IT is directed and controlled. It involves evaluating and directing the plans for the use of IT to support the organisation and monitoring this use to achieve plans. It includes the strategy and policies for using IT within an organisation."*(International Organisation for Standardization, 2008, p.3). In contrast, the IT Governance Institute(2003, p.10) expands this definition to include and identify foundational mechanisms so that ITG is seen as *"an integral part of enterprise governance and consists of the leadership and organizational structures and processes that ensure the organization's IT sustains and extends the organization's strategies and objectives"*.

Thus, an organization's system of governance for IT would include processes, roles and tools to enable the organization to plan, control and monitor its use of IT. However, there has been no consensus on the definitions of IT governance in industry and academia (Webb, Pollard, & Ridley, 2006). A number of definitions refer to the role of the board and top management whilst other definitions focus primarily on the role of management,

and technology managers. This lack of shared understanding and clarity has created confusion in both the literature and the workplace. The confusion is compounded when service and product companies use the words “governance” and “management” interchangeably. In reality, much of what is referred to as governance is in fact a management responsibility, which may be overseen by the governing body as part of an overall system of governance (Toomey, 2006). Zhao, McMurray and Toomey (p.62, 2008) note that the director of a large Australian government agency made the following remarks in relation to IT governance:

Effective IT governance is a key to the effective delivery of IT to our organization. The purpose of IT governance is to ensure that all IT endeavours are effectively managed and that IT's performance meets the following objectives:

- *IT is aligned with the business*
- *IT enables the business to maximise benefits*
- *IT resources are used responsibly*
- *IT risks are managed appropriately.*

The international standard ISO38500:2008 corporate governance of information technology fast track adopted in May 2008 from the earlier Australian Standard for Corporate Governance of Information and Communication Technology AS8015-2005 published in January 2005 although not a universal panacea for IT governance problems is a useful starting point for IT governance capability issues.

Drawing a parallel with how boards govern an organisation's financial, human and other resources provides a useful way of reconciling these diverse views on IT Governance. Governance responsibilities exercised by the board depend on management systems that provide the board with information such as proposals and performance reports on which the board makes decisions. The system for governance necessarily includes the management systems, because without the management systems, effective governance is impossible. (Toomey 2012) The propensity of some to classify IT management systems as governance perhaps reflects a lack of broader understanding of overall governance structures. On the other hand, recognition that management systems are an essential enabler to effective governance provides a powerful rationale for the view that governance effectiveness is substantially dependent on the management systems provides some justification for attempts to improve governance through improvement of the management systems. However, working on management systems without understanding the full context of governance as a system is likely to deliver sub-optimal results.

2.2 The Need for IT Governance

The role of the board of directors (particularly public listed companies) is under increasing scrutiny and hence subject to new legislated demands and increasingly subject to regulatory intervention. Understandably there has been a growing demand from various quarters for boards to be involved in governing their organization's use of IT. These demands are driven by the long-term failure of organizations to resolve poor performance in the delivery of IT projects, combined with increasing dependence on IT for their day to day operations. Project failures mean that money spent on the projects is wasted, and that the expected rewards of the investment are

not realized (Auditor-General, 2003). In many cases, operational failures have significant financial consequences (Luciw, 2004) as in some organizations IT accounts for approximately 50% of their capital spending (PRO:NED, 2007). Therefore, some failures have life-or-death consequences for the company and for people (Australian Pharmaceutical Industries, 2006). Studies show that industries and businesses have varied considerably in terms of their IT performance. According to a McKinsey study, “after spending \$7.6 billion on IT between 1995 and 2000, the lodging industry experienced no increase in revenue and no increase in productivity” (cited in King, 2007, p. 2). On the contrary, some businesses and industries are making significant improvement in productivity through IT and achieving new revenue streams and competitive advantage (King, 2007). Many consulting organizations and researchers have explored the frequency, cause, and impact of IT failures, and particularly IT projects. KPMG state that despite improved project management, failure rates remain constant. Furthermore, Gartner estimated that in 2001, US\$500 billion was wasted on failed IT initiatives (Gartner Group, 2002). The long running Standish Chaos Report stated that only 16.2% of projects were successful in 1994 (on time and on budget) (Standish Group, 1994). In 2004, Standish detailed 28% were successful, a reduction from 34% in the previous year (cited in Hayes, 2004). One should note that there is an inconsistency in the Standish reporting of these figures where in one case the averages were reported as high yet careful reading uncovered that during the IT investment downturn, fewer and less adventurous projects were undertaken and there was an expectation that performance would deteriorate again as investment rates ramped up. Hence inconsistencies in the reporting of the averages of these figures should be viewed with caution. Moreover, KPMG clearly state that the measure of success is shifting from “on time, on budget” as assessed by Standish, to “achievement of intended outcomes,” which the authors believe Standish overlooks. KPMG (2005) assert “Failure rates are still appalling and “Many organizations do not focus on realising or measuring benefits.” Huff, Maher, and Munro (2006) researched the extent to which boards actually understand and address IT issues. They found an “IT attention deficit” with boards attending only to IT risk and mostly failing to address IT in the context of vision, strategy, competitive advantage, effectiveness, and major project decisions. KPMG recommended board level governance as essential: “The key element (that makes some organizations more successful) appears to be an appropriate governance framework—to complement planning and prioritisation of activities and to help ensure execution controls are in place until benefits are realized.” Their nomination of board responsibility was direct and explicit: “The board must put in place, through management, a rigorous oversight framework to monitor achievement of budgets, the meeting of timelines and to help ensure that the agreed benefits are realized. To achieve this, the board must receive the right information at the right time.” KPMG’s assertions are entirely consistent with the findings of Weill and Ross (2004), that organizations with effective IT governance produced not only better success rates for IT, but also better overall corporate performance. Consequently, there is a growing trend towards boards undertaking a much higher level of governance relating to their IT investment (PRO: NED, 2007, p. 1).

The purpose of IT governance is to direct IT endeavours to ensure that IT performance meets the organisation’s strategic objectives. Essentially, these objectives are the realization of promised benefits as a result of IT alignment with that of the organization, the exploitation of opportunities and maximization of benefits from IT enabling the organization, the responsible use of IT resources, and the appropriate management of IT-related risks (Chalaris et al., 2005; ITGI, 2003). Senior management needs to be better assured that the organization’s

IT objectives are met. Hence, the importance of the focus on the process by which an organization's IT is directed and controlled for therein lays the significance of IT governance. Furthermore, with effective governance, the return of IT investment will be high and thus business investment in IT can be optimized to extend business strategies and goals. These claims are supported by studies from Weill and Ross (2004) and the IT Governance Global Status Reports (ITGI, 2006; ITGI, 2008).

In order for IT to be governed there must be recognition of the need for governance and a shift in the accountability for IT-related decisions to the top of the organization. A review of literature on IT governance reflects a commonality in that IT governance is considered a top management concern (Johnson, 2005; Luftman et al., 2004; Read, 2004; Hardy, 2002). It is important that senior management has a working knowledge of the concepts and issues related to IT governance. An effective governance of IT is essential as IT significantly impacts an organization's business. This can be seen when IT delivers value to the organization by keeping IT initiatives aligned with the organization strategy and when risks are mitigated by establishing accountability and monitoring of IT performance (Read, 2004; ITGI, 2003).

Past literature on IT governance has focused on the domains of IT strategic alignment, IT resource management, risk management, performance measurement, and IT value delivery. These five domains have gained global recognition as accepted relevant domains of IT governance as they are business-driven and align closely with the issues on which the board and executive management focus (Johnson, 2005). In addition, they represent five management-related issues associated with IT governance responsibilities (ITGI, 2003).

2.3 Key Themes of International Standard ISO 38500:2008

The International Standard ISO 38500:2008 Corporate governance of information technology was developed with a view to improving the performance of organizations in their use and delivery of information and communication technology, areas where there are historically significant levels of underperformance across many organizations in both the public and private sectors. ISO 38500:2008 provides guidance to directors and to those who advise directors, typically the members of the executive management team, but also members of steering groups, specialists, suppliers and service providers, auditors, and other advisors. ISO 38500:2008 recommends that directors who are the members of the most senior governing body of an organization should evaluate, direct, and monitor the organization's use of IT. This view is also supported by PRO: NED (2007). ISO 38500:2008 also notes that directors may delegate their responsibility, but not their accountability (p.8, ISO/IEC 38500:2008). In the normal course of events, the detail of governance processes is invariably the responsibility of managers within the organization. But the directors should always be aware of IT governance, and assure themselves that the processes are delivering the required outcomes. It should be noted that ISO 38500:2008 is designed to provide guidance rather than to define rigid rules for compliance. It is therefore open to the directors and managers of organizations to determine exactly how they will implement their approach to the corporate governance of IT. The introduction to ISO 38500:2008 describes a set of broad characteristics of good IT governance practice. ISO 38500:2008 presents a framework of three key tasks for governing IT:

- Evaluate the use of IT
- Direct preparation and implementation of plans and policies
- Monitor conformance to policies and performance against the plans

There are six principles in ISO 38500:2008 to guide directors and the executive in the conduct of these tasks as follows:

1. Responsibility: Establish clearly understood responsibilities for IT
2. Strategy: Plan IT to best support the organization;
3. Acquisition: Acquire IT validly
4. Performance: Ensure that IT performs well, whenever required
5. Conformance: Ensure IT conforms with formal rules
6. Human Behaviour: Ensure IT use respects human factors

ISO 38500 provides clear distinction between the roles of the board and management, and positions responsibility for planning, implementing and operating IT-enabled business capability clearly in the domain of management. Thus, the role of the board would be defined as part of the system of governance for IT, but it would not typically require the board to participate in the detail of the system. Within this system model, it is critical that there are appropriate and effective channels of communication between the overseeing body (the board) and management. If the channels are inadequate, management may not be aware of strategy and policy, and the board may not have adequate visibility of what is happening. The design of the communication channels, and many of the processes in the system, will depend significantly on the overall nature of the organization. For example, in smaller organizations, as reflected in the experience of a small government agency, the emphasis in governance may be quite different to that of a larger organization and the actual role of the executive and board may vary from one of significant engagement to one of quite high level oversight. As Weill&Ross (2004) found, any design can be quite effective. However, what is important is that the chosen design works, and that, at the top of the governance model, there is sufficient oversight to ensure that the system is functioning appropriately. The context for the application of ISO 38500:2008 in terms of entrepreneurship and innovation is critical to the way an organization considers which IT innovations facilitate their competitive performance and hence advantage in the market place through competition, economic welfare and hence overcoming market monopoly (Teece, 2002). Many established methodologies and management standards concentrate on the processes for delivering an organization's IT capability whereas ISO 38500:2008 focuses on the macro picture of the combined governance and management systems in which the organization determines how it will use IT i.e. demand drives supply and is the dominant focus of the standards to date. From the brief overview of the purposes and coverage of ISO 38500:2008, the standard should be a commendable performance measurement system and form the basis of the survey instrument developed for determining IT governance capability. This study employed the ISO 38500:2008 framework in developing its survey tool and a majority of its interview questions. Further detail and the results of the study are discussed in the following sections of the paper.

3.0 RESEARCH METHOD

This study implemented a research design comprised of a questionnaire administered concurrently with a program of instruction.

In 2005, an 84 point diagnostic tool was designed by Infonomics, based on AS8015, the Australian Standard for Corporate Governance of Information and Communication Technology, which was subsequently, and with minimal change, adopted as ISO 38500: 2008. The design of the diagnostic tool derives from the structure of ISO 38500.

Using ISO 38500: A framework for evaluating governance

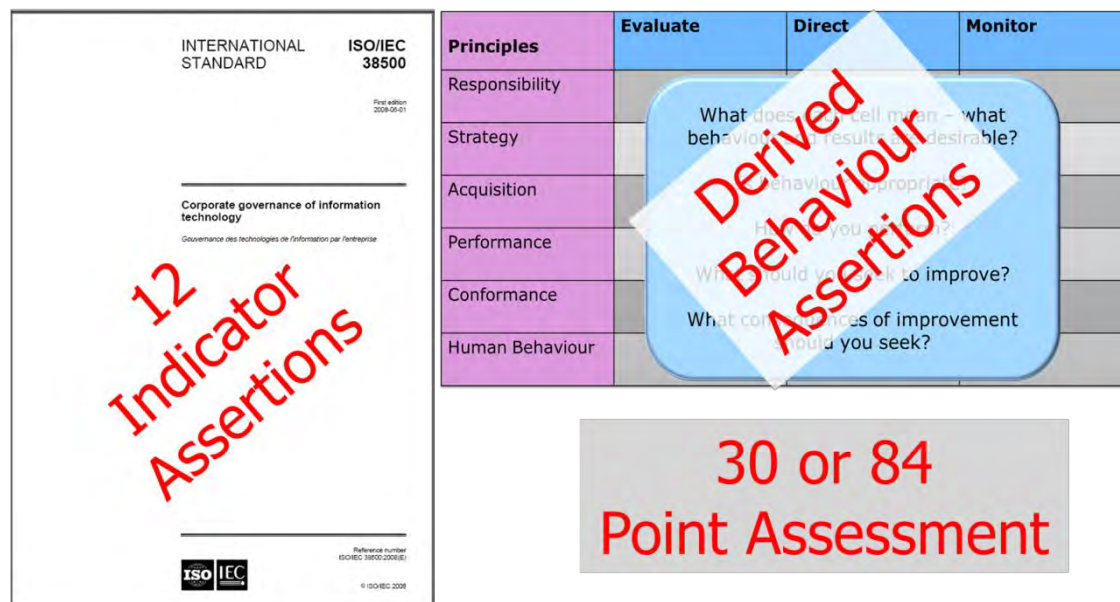


Figure 1: Self-assess against ISO 38500.

Source: Infonomics Pty Ltd.

The initial text (Preface and first chapter) of ISO 38500 provide the basis of 12 broad (Indicator) assertions regarding desirable behaviour, capability, performance and outcomes for any organisation's use of IT. Two of the assertions are also strongly influenced by Weill&Ross (2004). The matrix implied by juxtapositioning the three governance tasks (evaluate, direct and monitor) against the six principles for good governance of IT defines 18 cells in which governance arrangements can be constructively examined. In the 30 point assessment, these cells are tested by a single complex statement of expected behaviour for each cell. In the 84 point assessment, four statements are used per cell, providing finer granularity and consequently deeper insight regarding the effectiveness of an organisation's IT governance arrangements.

Since its inception in 2005, the diagnostic tool referred to in Figure 1 has been administered to more than 1000 individuals in numerous industry sectors, in conjunction with formal consulting engagements, education events, seminars and conferences. When used to assess governance of IT in a specific organisation, the diagnostic is administered to a selection of management, planning, project and operational personnel, selected to provide a broad and deep coverage of perspectives on the behaviour, performance and conformance of the organisation in respect of its current and future use of IT. These personnel are targeted because they *should* be sufficiently aware and informed that they are able to accurately reflect the organisation's real situation. Their individual and collective responses provide insight for themselves as individuals, for management and for the overall governing

body regarding the effectiveness of current arrangements for governance of IT. The perspective that emerges from the assessment is not one of whether or not the directors are receiving the necessary information, but of whether or not the management systems are effective. If management systems are not effective, directors are unable to adequately direct and monitor the use of IT, because direction will not be applied properly and feedback information will not be provided appropriately.

The diagnostic is also used by Infonomics as a primary teaching tool during delivery of formal training in ISO 38500. In the Infonomics ISO 38500 Foundation Class, the full 84 point version is used, whereas in other events, the shorter 30 point version is usually employed. As topics are explained by the instructor, participants are invited to score their employer (or in some cases, client) organisation using the diagnostic tool, and to discuss the results of the scoring. Records of scores are collected, stripped of identifiers, and retained for modelling at the end of most classes, and for subsequent research and modelling.

The data presented in this paper is from a selection of five separate, independently delivered ISO 38500 training classes of one or two days' duration, presented in five nations, over a six month period from January to June 2011. During the period of the classes, there were no changes made to the assertions in the diagnostic tool, nor to the method of scoring, or to the data collection and modelling methods.

Respondents to these five surveys, as voluntarily enrolled participants in a training class, do not represent a random sample of the population. While no specific demographic information has been retained in respect of the participants in these five events, it is clear that the individual training classes were attended by individuals who were familiar with the governance arrangements prevailing in their organisations at the time and who could therefore be presumed to be knowledgeable about the behaviour, performance and conformance of the organisations in which they were employed. Their participation in the events also reflected a common desire to better understand the guidance presented in ISO 38500 which, for low performing organizations would be seen as an opportunity for improvement and for high performing organisations as a potential opportunity for further refinement of an effective system. This does include what seems a reasonable assumption, that exemplars are always seeking insight and knowledge to further enhance their performance. Thus, the participants in these events represent an important class of business and technology managers who are aware of the importance of IT to business, who have an interest in optimising governance of IT, and who are, arguably, well informed about the governance arrangements and effectiveness of their employer and client organisations, regardless of what level of sustained performance those organisations actually deliver. They are likely to present an accurate and informed view of governance arrangements in the place in which they work. Because the scoring scale used in the tool accommodates an "I don't know" response, results tend to confirm that respondents are reasonably well-informed, because they do express a definite view on most of the assessment points. Respondents come from a range of roles, with the majority being in senior IT management roles. A small number of middle and senior business managers also participated in some of the events.

3.1 IT Governance Indicators

The 12 IT Governance Indicators are constant for all uses of the diagnostic tool. Respondents rank their respective organizations' performance against the IT governance indicators derived from ISO/IEC 38500:2008 Corporate Governance of Information Technology, as described above. The twelve IT governance indicators describe outcomes, behaviours and performance that should be associated with an effective system of IT governance, namely:

- Existence of a formal IT governance system
- Business and technology management compliance with the system
- Effective protection against the likelihood of IT failures
- Informing & engaging managers and directors in key IT decisions and oversight
- Dependence of ongoing business operations on IT understood
- Continuity & sustainability of business through IT use
- Alignment of IT capability to business need
- IT resource allocation
- Appropriate use of IT in business innovation
- Demonstrated investment value of IT
- Capability to deploy new IT initiatives
- Control of IT related business risks.

3.2 IT Governance Behaviours

The main body of the diagnostic tool is derived from juxtapositioning the three tasks for governance (Evaluate, Direct and Monitor) set out in ISO 38500 against the six principles. This creates an 18 cell matrix in which behaviour can be assessed, and which allows results to be aggregated in two dimensions – for principles and for tasks. When used in training shorter (one day duration) classes, one macro level assertion is tested for each cell. When used in longer classes, four detailed assertions are tested for each cell, and the cell score is computed as the average of the four points.

3.3 Scoring Method

The assessment points are designed to collect both quantitative and qualitative data. The scoring of assessments is done by using a 6-point Likert scale as described below. Depending on the context in which the diagnostic tool is used, participants also have the opportunity to comment verbally, debate with peers and add open ended written comments and evidence.

Interpreting the charts generated through use of the diagnostic tool requires an understanding of the relationship between how people score the individual assessment points and the scale used to rate the effectiveness of the prevailing arrangements for governance of IT. A technique for this that has proven effective in many countries is to contrast the assessment of how well an organisation governs its use of IT with an assessment of how well an individual drives a motor car. The assessment points describe capabilities for governance of IT in a similar manner to how one might describe capabilities related to driving a car. Scores are given to each assessment

point individually, and combined to form an aggregate view. Low scores for individual points on driving a car correlate with a low ability to drive safely, while high scores on individual points suggest well-developed ability to drive a car. Validity of the assessment depends on the relevance of the criteria used. For a driving assessment, criteria derived from a robust framework of driving capabilities by an expert in driving would provide a sound framework for assessment. In this case, the assertions tested are derived from an internationally recognised framework by an expert involved in the development of that framework.

It has been pointed out many male drivers over-estimate their ability to drive a car, Similarly, managers in many organisations believe that their organisations have good governance of IT, but cannot substantiate such claims with evidence and in many cases of IT failure, it becomes evident that the organisation thought it had a higher level of capability than the outcome showed. Australian Customs (Toomey, 2005) believed that it had the best IT Governance of any Australian Government department and publicised this during the time when the catastrophic failure of its Cargo Imports System was closing down Australia's ports.

Extending the metaphor, it is quite possible that passengers in a car will score a driver's ability differently to the driver – especially where the driver exhibits over-confidence, excessive risk taking or perhaps an excess of caution. A driver who self-evaluates using a rigorous driving assessment framework may be surprised by the scores given by recent passengers.

Thus, the design and application of the assessment tool discussed here relies on the insight not just of those who have put in place the governance arrangements, but more importantly on the experience and insight of people who operate within or who are affected by the governance arrangements.

With this approach to scoring in mind, we can see that the scores presented in the chart have the following meanings:

- “No view” for a person driving a car means not just that they can't drive; they also don't understand what a car is for. Individual assertions have received a predominantly “I (or my organisation) don't know or understand” response, with a score value of 1. An organisation perched at this level of IT governance would lack organisational awareness of the role IT plays in business.
- Using the same analogy a score of “None” on the driving scale means that a person would know what a car is, but have no idea how to operate the car. Individual assertions have received a predominantly “I (or my organisation) understand what this means, but I (we) don't do it” response, with a score value of 2. When applied to governing IT, “None” means being somewhat aware of the role of IT, but having no concept of how to govern its use.
- At the “Weak” level, an individual would be able to get into a car, start its engine and make it move forward. However, at the first obstacle, or very soon after, a crash would occur. Individual assertions have received a predominantly “I (or my organisation) understand what this means, but I (we) have only a bare minimum match to the assertion” response, with a score value of 3. Organisations with weak governance of IT can identify some use for IT, and may be able to launch some IT related initiatives. However, most initiatives will fail early, even if the failure is not recognised until considerably later.

- People with “Basic” driving skills appear quite competent on the surface. They can use a car confidently to perform routine tasks and journeys, including shopping trips and holidays. However, when confronted with dangerous circumstances, such as an unrestrained animal on the road, severe weather or another driver losing control, they are very likely to experience a crash in their own right. Individual assertions have received a predominantly “I (or my organisation) understand what this means, and I (we) have a significant match to the assertion, but there is considerable room for improvement” response, with a score value of 4. Companies with basic governance of IT can formulate some plans for the use of IT, launch some initiatives, and conduct normal IT-enabled business operations. However, when something goes wrong, these organisations are poorly equipped for early recognition of the problem and have very limited ability to take effective corrective action.
- “Good” drivers have well-developed skills that help them plan ahead to avoid danger, to act early and decisively to remain safe when an unexpected risk emerges, and can execute emergency manoeuvres to protect themselves and others when the risks turn into real problems. Individual assertions have received a predominantly “I (or my organisation) understand what this means, and I (we) have a strong match to the assertion, with minimal need or opportunity for improvement” response, with a score value of 5. Organisations that have good governance of IT not only make very good plans for the use of IT, they can execute these plans with a high degree of competence, can make adjustments to maximise value, take appropriate action to head off project failures and are rarely, if ever disrupted by operational breakdowns.
- “Exemplary” drivers have invested heavily to master the art of driving, and have talents far beyond those required for safe and successful driving on public roads. These are the motor racing world champions and their top flight competitors. Individual assertions have received a predominantly “I (or my organisation) understand what this means, and I (we) set the benchmark from which others should be learning, with no real need or opportunity for improvement” response, with a score value of 6. Very few are truly at the full exemplary level, and many who fall between the good and exemplary levels will struggle mightily, but never attain the pinnacle. It’s questionable if any organisation needs to be exemplary across the board in governance of IT as the cost would likely be prohibitive for the vast majority. However, exemplary capability in selected aspects of governing and using IT may be viewed as giving rise to a competitive advantage. Such a determination if any would have to be made on a case by case basis, by the leadership of the organisation in question.

4.0 FINDINGS AND DISCUSSION

This section summarizes and discusses the key findings from the seven training events, attended by a total of 107 people. The results of the survey present the current IT governance status and performance of the organizations studied against the ISO 38500:2008 framework.

4.1 Survey Context

The survey instrument was applied in the five countries studied as a self-assessment exercise, integral to a training course. Each participant scored his or her selected organisation's effectiveness in governance and use of IT. For ease of comprehension by participants in the classes, results are presented using the most basic of statistical analysis techniques – mean, minimum and maximum. While not presented for all of the data collected in these cases, experience of calculating median scores in other applications of the diagnostic instrument have shown strong correlation between mean and median, suggesting a relatively normal distribution of responses. On this basis, the mean is regarded as an effective “score” for IT Governance.

Almost universally, in all of the five countries where it was employed, the survey instrument revealed that governance and performance of the use of IT are in need of significant improvement. This was also the case for Oman and the United Arab Emirates (UAE), where the full 84 point self-assessment was administered. Figure 2 presents an overview of the combined assessment scores given by respondents in the two countries.

4.2 UAE and Oman Result

Figure 2: ALIGNMENT TO ISO38500 – UAE & OMAN, APRIL 2011

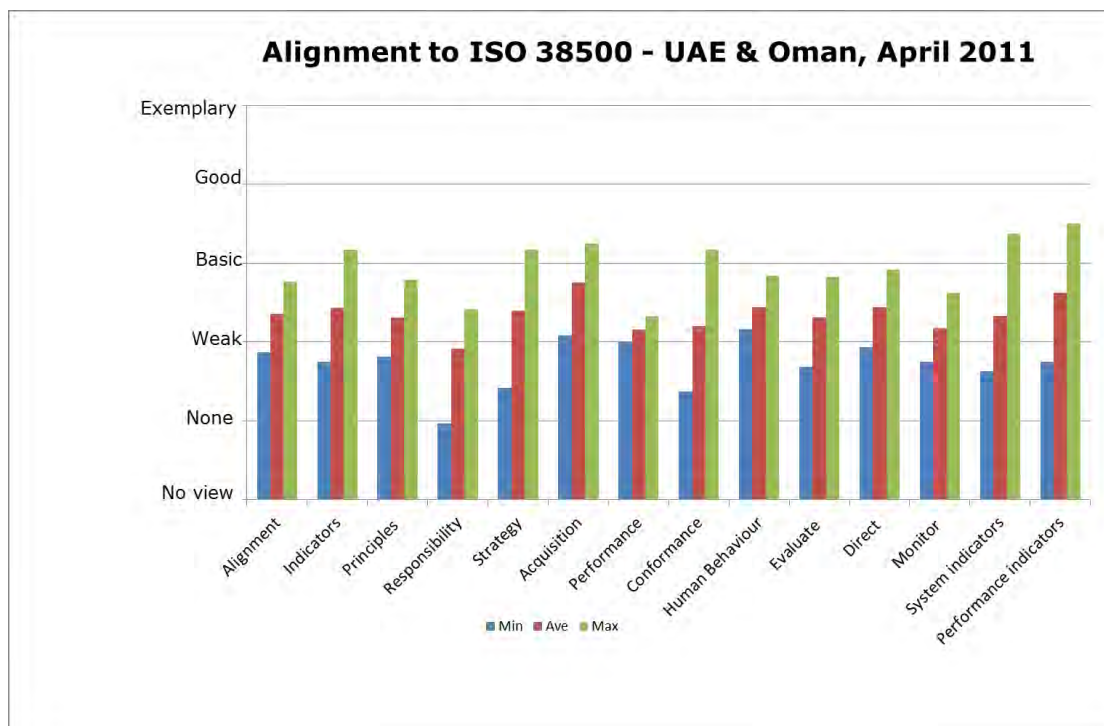


Figure 2 presents the assessment results as the lowest, average (median) and highest scores across the sample group. The first set of three columns depicts the overall “index of alignment”, or overall effectiveness of then-current arrangements for governance of IT. This is the composite view derived across the entire 84 point survey instrument. Subsequent column sets present various subsets of the data.

Looking at Figure 2, we can see that overall the respondents ranked their organisations as having slightly better than weak governance of IT. The highest scoring individual assessed his or her organisation as having slightly less than basic capability to govern the use of IT. This is certainly a strong indication that there is room for significant improvement.

Moving to the right of Figure 2, we see that the scores for the twelve indicators, as well as for the six principles (72 points in total) are broadly in line with the overall assessment. This underpins the view that the indicators employed are a useful and moderately reliable guide to the overall effectiveness of governance arrangements.

However across the six individual principles of ISO 38500 marked differences begin to emerge. There is weak capability with regards to assigning responsibility and further weakness in the formulation of strategy and plans. These however are essential capabilities and organisations which have not clearly and appropriately assigned responsibility to individuals with the means to discharge that responsibility are likely to have the wrong people making decisions about IT, and basing those decisions on wrong criteria. Those with inadequate strategy and planning oversight are unlikely to work on the most appropriate initiatives, and may not have the capabilities in place to achieve their desired goals.

Whilst not yet at the desirable “good” level, the Gulf Cooperation Council (GCC) countries Oman and UAE show more effective governance against the Acquisition and Conformance principles, with some relative strength also in the area of Performance. These “bumps” are common across most jurisdictions, principally because in the case of acquisition, general controls regarding financial, purchasing, contract and similar decisions are well-established and mostly benefit from experience with disciplines other than IT. However, these controls do not typically have the sophistication or focus necessary to provide an effective level of governance in respect of IT.

Some of the relative strength in performance and conformance also comes often from the ability of those involved in the supply of IT to instigate controls that while often not properly understood by those who use the services of IT, still have some effectiveness.

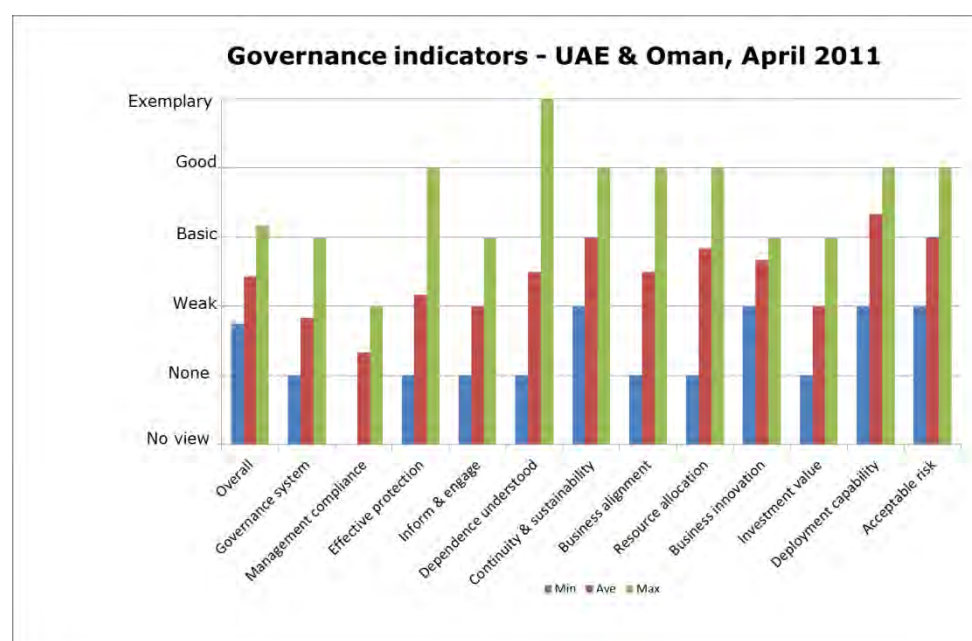
On the subject of Human Behaviour, the GCC results are somewhat better than is often seen in the rest of the world, with a score well above those for Responsibility and Strategy. This suggests that arrangements for governance of IT in the region may be giving a little more attention to the characteristics of people in the process than in some other regions. Attention to human behaviour is critical for the contemporary use of IT, because people as individuals and in groups are significant influencers of success with IT, in diverse roles ranging from remote customer to internal employee, business planner and manager, IT specialist and people actually working to deliver project outcomes.

The next three columns “Evaluate”, “Direct” and “Monitor” take an alternative slice through the data, looking at whether there is balanced emphasis on the three basic tasks for governing the use of IT. The differences in these three items indicate that organisations in the GCC should elevate attention to all three aspects, with monitoring requiring the most improvement. The current data indicates that there is a tendency for some direction to be

given but with little analysis and even less follow-up or checking. This could result in whatever direction that is given being incorrect or inappropriate, and then not followed anyway. Looking at whether there is balanced emphasis on the three basic tasks for governing the use of IT, the differences in these three items indicate that organisations in the GCC should elevate attention to all three aspects, with monitoring requiring the most improvement.

The final two column sets in Figure 2 segment the twelve “Indicators” into one set that reflect the performance of organisations in their use of IT and the arrangements for governance of IT. The consistency between the two is suggestive of a view that improved governance may improve performance.

Figure 3: GOVERNANCE INDICATORS – UAE & OMAN, APRIL 2011



A closer view of the Indicators presented in Figure 3 allows us to explore some correlations and contradictions that frequently emerge. In detailed assessments, these correlations and contradictions are more fully understood through analysis of responses on the principles, face to face interviews and examination of actual documents. The four indicators of performance are those labelled *Business Alignment*, *Business Innovation*, *Investment Value* and *Deployment Capability*. Note that scores for two of these indicators (*Business Innovation* and *Investment Value*) are quite low. This suggests that, while IT initiatives are being deployed, they are not creating significant measurable value and not advancing the capability of the business. This is consistent with the low score on *Business Alignment*. Considering the technical supply side dominance of the groups participating in this survey, the relatively high *Deployment Capability* shown may be more focused on the technical deployment, with less emphasis on the business deployment that is required to realise the actual value of an initiative.

Having even rudimentary systems for governance of IT should help organisations set direction for, derive value from and control risk associated with IT, but only when the system is actually used. The gap between

Governance System and *Management Compliance* is significant. The absence of a blue bar (minimum score = “no view”) on the latter suggests that the idea of management following a defined system is a foreign concept for at least for one organisation. Weak governance systems and governance systems that are not used will not provide *Effective Protection* against failures, and will certainly not do anything to inform and engage business leaders.

Much higher scores (although relatively speaking they ought to be higher) on *Dependence Understood* and *Continuity & Sustainability* are likely to be a product of the audience that was completing the survey instrument being mostly senior IT professionals. They would be expected to have this awareness themselves, and some may attribute a higher level of awareness to their business counterparts than is the reality. When used inside a single organisation, the survey instrument frequently shows up stark contrasts in this area.

It is common, yet always disturbing, to note the relatively high score on *Acceptable Risk*, given the very low scores relating to use of a defined governance system and the leadership being informed and engaged. The low scores on *Business Alignment*, *Business Innovation* and *Investment Value* also contradict the relatively higher score for *Acceptable Risk*. Again, this may be explained by a predominantly technical audience looking at risk from the supply side, rather than the broader view.

Looking more broadly across the twelve indicators, it is interesting to note that while at least one person graded ten of the twelve points at “good” or better, none graded *Business Innovation* and *Investment Value* better than “basic”. This reinforces the view that even those with perceived strengths probably have weaknesses that need to be resolved.

Figure 4: ALIGNMENT TO ISO38500 MODEL – UAE & OMAN, APRIL 2011

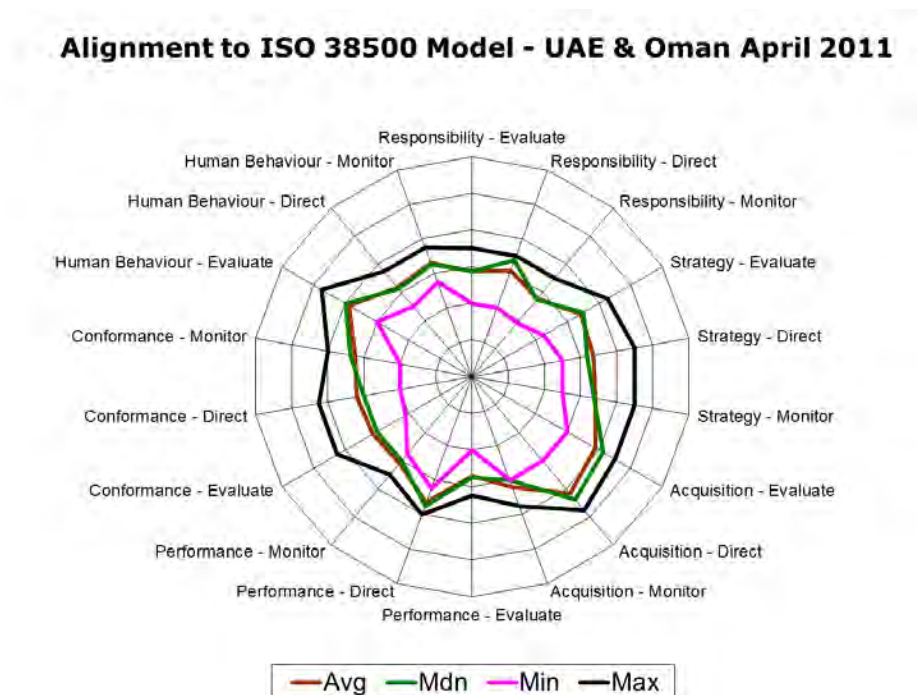


Figure 4 extends our insight into the calibre of governance arrangements profiled by the ISO 38500 survey respondents in the UAE and Oman. The spider diagram provides a more detailed view on the principles, enabling us to understand the relative emphasis given to evaluating, directing and monitoring in respect of each. There are again some significant anomalies, which help to highlight where attention ought to be given to improving the governance arrangements, and thereby the overall performance in the use of IT. Note also in Figure 4 the close correlation between mean and median, pointing to a relatively normal distribution in responses.

Responsibility: Within the uniformly low (and therefore unsatisfactory) scores, it appears that some organisations pay less attention to working out who should be responsible than they do to actually assigning responsibility, and then few organisations actually monitor to ensure that this responsibility is adequately discharged.

Strategy: Organisations seem to put some effort (although more is needed) into evaluating strategy and planning issues, but then do not follow through to put the plans into action and check that they are in fact actualised.

Acquisition: Higher levels of control here in evaluating options and directing acquisitions are undone by a lack of monitoring.

Performance: the minimalist approach to evaluation raises some questions about the origins and legitimacy of the direction given, and the limited monitoring in place could create some doubts if performance gaps are well understood if at all.

Conformance: often scores high, as previously discussed, but again the pattern is one where monitoring falls away, leaving one to wonder if organisations are at risk of conformance breaches despite having put some rules in place. It is also evident here that a small number of respondents scored higher on evaluating and directing conformance than the main body, and that the majority scores these points much closer to weak than to basic.

Human Behaviour: one relatively high scorer does not offset the overall picture that most of the organisations pay uniformly little attention to the characteristics of people in the process.

The snapshot provided in this assessment is limited by the supply side bias amongst the respondents. Nevertheless it does strongly suggest that there is both the need and opportunity for substantial improvement in governance of IT in the GCC region, and the number of senior IT people involved gives confidence that there can be a strong push for improvement in this regard. It may be necessary for the push to begin in the supply side, but by increasing the focus on business issues and related governance matters, a progressively deeper engagement of business leaders should be expected and encouraged.

4.3 Contrasting Five Nations – UAE, Oman, El Salvador, Malaysia and Argentina

During the period covered by this report, the Infonomics diagnostic tool was also applied during training events in Malaysia (twice, using the full 84 point version), Argentina (once, using the 30 point version and El Salvador (twice, but only the 12 indicators were used).

Figure 5: COMBINED “INDICATORS” ASSESSMENT RESULTS FROM FIVE NATIONS – JUNE 2011

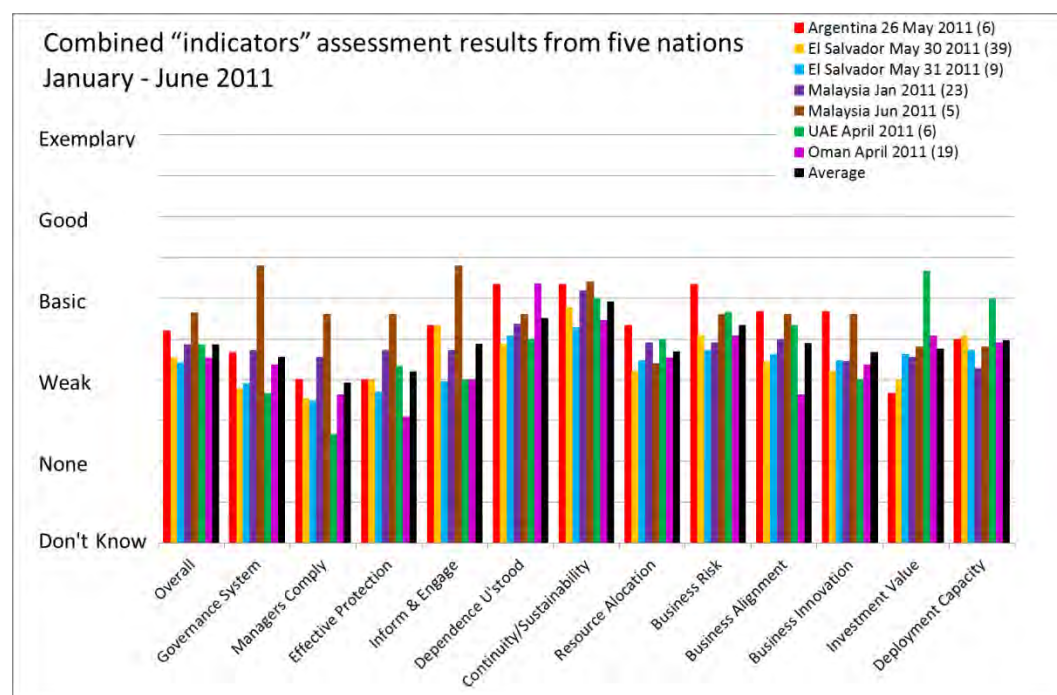


Figure 5 presents the combined indicators assessment results from the five nations surveyed during 2011. The numbers at the right in the legend are the sample size, which ranges from 39 in El Salvador to 5 in Malaysia. The indicators are 12 points of performance and capability that can be used to form an approximate initial view of how well any organisation governs its use of IT. In a full assessment, the indicators are complemented by a further 72 points linked to the principles defined in ISO 38500.

The results indicate that weakness in IT governance has a similar profile across the five nations, where business leaders are not consistently engaging in the essential business leadership, business change and operational management activities for planning, building and running an IT-enabled business. The results clearly indicate the continuing widespread relevance of ISO 38500.

It is rare for any respondent to claim exemplar status on any specific point of assessment. Most people who undertake the assessment are in fact quite brutal in their self-assessment and many comment that while the exemplar statements are quite reasonable, there is significant opportunity for improvement. When used in a single organisation, the survey instrument provides a way of rapidly segregating consistent and inconsistent

views, and of establishing agreement on both the need and opportunity for improved governance in the use of IT.

In the case of the second and smaller Malaysia sample, one individual respondent consistently claimed exemplar status, driving up the overall sample average. Other responses were more consistent with the responses from the much larger Malaysian sample collected earlier in the same year.

Reading Figure 5 from left to right, we can see that the five nations, across the seven surveys carried out, have weak to basic governance of IT **overall**. This weakness results from the tendency of not having a clearly defined **governance system**, and the limited extent to which all **managers comply** with the specifications of the system. Without an effective governance system, it is not surprising that there is little **effective protection** against things going wrong with IT. While some individual managers may be well aware of what is happening with IT, it is more likely that an effective system of governance would better **inform and engage** those managers, executives and members of the governing body whose job it is to ensure that IT use is effective, efficient and acceptable.

The pervasiveness of IT and the potential consequences of IT going wrong contribute generally to a higher level of awareness of the role that IT plays. However, there remains a significant gap between the current and desirable extent to which business **dependence on IT is understood**. Efforts by IT supply teams tend to underpin some confidence in the extent to which IT use protects the **continuity and sustainability** of the business, but across the board there remains significant opportunity for improvement. The gap is perhaps exemplified by the fact that **resource allocation** does not meet the needs of the organisations represented in the survey, and the perception that the **business risk** of serious IT failure is not well understood.

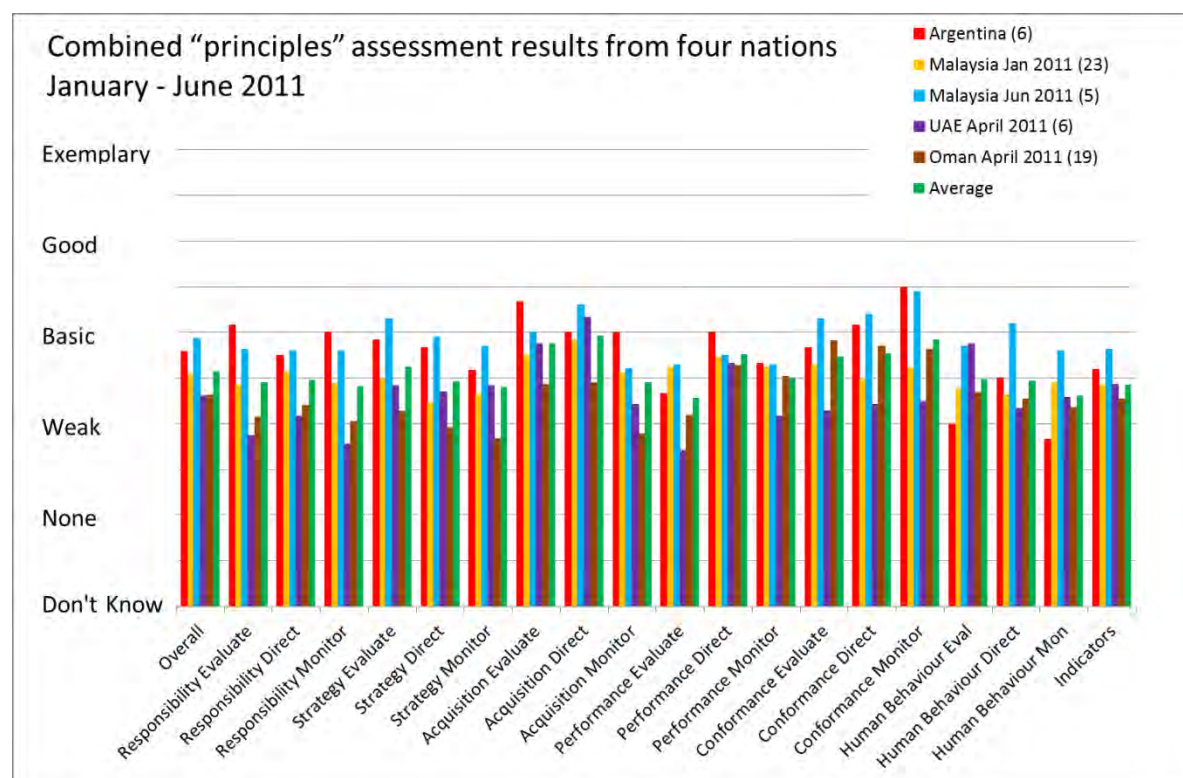
Business alignment is a perennial problem, frequently discussed in many forums. The poor ranking across these seven surveys is perhaps explained by the corresponding low ranking for the governance system, management compliance and the extent to which the appropriate people are informed and engaged. A similar point may be made with regard to **business innovation**, where advanced use of IT in support of business innovation depends on a well informed and engaged management team that can properly understand and effectively manage business risk.

Investment value is delivered when IT initiatives produce business outcomes and defined, measurable benefits. Delivering business outcomes depends on a properly engaged and informed management team, which understands that the value of investment in IT comes from attention to the full spectrum of business change, and not just to the IT components. Such attention depends heavily on adequate resource allocation, a sound understanding of how to ensure alignment of IT and business activity, and an effective approach to understanding and controlling risk. The weaknesses expressed in these areas may also explain the extent of opportunity for improved **deployment capability**, through which IT enabled change, becomes an operational aspect of the business for which it was developed.

4.4 A Deeper View of Four Nations

As mentioned above, use of the diagnostic tool in El Salvador was limited to the 12 Indicator Assertions. In Argentina and Malaysia, the complete model was tested using the 30 point version (Argentina) and the 84 point tool (Malaysia). Consistency of the diagnostic assertions and scoring method makes it practical to compare scores for the principles and tasks across four nations (UAE, Oman, Malaysia and Argentina).

Figure 6: COMBINED PRINCIPLES ASSESSMENT RESULTS FROM FOUR NATIONS JUNE 2011



Bearing in mind that the smaller Malaysia group included one individual who had a propensity to give relatively high scores, Figure 6 shows that there is a significant consistency across the nations in how engaged managers view IT Governance. The overall results and the indicators fall within a narrow range, a little less than half way between weak and basic. These scores would suggest that many aspects of IT are problematic, that failures are common, and that value is rarely delivered. It can hardly be surprising that these results are consistent with real-world anecdotes and the frustration that many business leaders in particular have with their investments in IT.

While Argentina appears to have a generally stronger alignment to ISO 38500 than the other nations, it does nonetheless have some interesting low points – notably in respect of human behaviour. While it does outrank others in several areas, Argentina also demonstrates variability in which its evaluation and monitoring practices are sometimes ranked high, and at other times quite low. Argentina should be looking at how to become more uniform in these areas, and how to lift all practices to a higher level.

As expected, IT acquisition practices appear to benefit from broader procurement practices, especially in respect of evaluating and directing acquisitions. However, a markedly lower average across the four nations for

acquisition monitoring suggests a tendency to “buy and forget” rather than a drive to maximise value derived from any investment.

On the other hand, a long-established IT industry characteristic of focus on technical performance may explain why the scores for performance-evaluate are much lower than performance-direct and performance-monitor. Are targets set and pursued with insufficient consideration of what targets are appropriate? Perhaps this behaviour could explain a frequently-observed gap between perceptions of performance adequacy of business users and owners of IT systems and their IT specialist counterparts.

5.0 CONCLUSION

The data collected from business and (predominantly) IT professionals who attended seven training events across five nations during the first half of 2011 reveals that IT Governance capability in these nations lies between weak and basic. Such relatively low levels of capability are consistent with the continuing widespread global concern that investment in IT is expensive and fraught with risk, and the continuing concern expressed in diverse studies regarding business-IT alignment and other factors. Importantly, consideration of the relatively low scores prompts contemplation of an important question: “can improvement guided by adoption of ISO 38500 lead to better performance”. It stands to reason that the simple answer is “yes”:

- More emphasis on working out how to assign responsibility should result in better assignment and enforcement of responsibility, leading to better decisions about the use of IT and greater ownership and accountability for delivering business outcomes and results.
- Increased focus on assessing strategy options and formulating plans will benefit from more effective monitoring that enables frequent adjustment of focus and direction, as well as abandonment of strategies which for whatever reason are likely to fail.
- Similarly, increased emphasis on monitoring in respect of acquisitions should result in a higher proportion of investments being successful, and failing investments being terminated at an early stage.
- A fresh approach to performance driven by careful consideration of exactly what performance goals are appropriate (evaluate) should build on and drive further development of capability to pursue performance goals, leading to improved business outcomes and results.
- While showing a relatively strong score in this assessment, conformance arrangements for IT often reflect a regime where IT specialists are strongly in control. As cloud computing advances, these strengths may be found to be weaknesses as well. A new emphasis on evaluation the conformance needs of the organisation is likely to drive a new approach to setting, communicating and delivering conformance outcomes, and complementary adjustments to monitoring of conformance.
- Recent experience with social media in particular is emphatically demonstrating the importance of understanding, focusing, energising and accommodating human behaviour. A significant uplift in the attention organisations give to human behaviour as part of their overall approach to governance of IT is likely to result in plans that better engage and win acceptance of the communities affected by an

organisation's use of IT, and a parallel uplift in an organisation's ability to engage with and gain advantage from the independently determined directions that individuals and communities are taking in respect of their own use of IT.

Malaysia was one of the first countries to begin embracing ISO 38500 as part of the learning agenda for its business and IT leaders. While the GCC states clearly enjoy the benefits of substantial oil wealth, they are otherwise very much developing economies building capability for a sustainable future beyond oil. El Salvador, Malaysia and Argentina are also nations that are focused on developing their economic futures. By embracing the guidance in ISO 38500, these nations should improve the likelihood that their investments in IT will produce outcomes that deliver value for money and future economic performance.

Improved performance in IT governance results not only from learning about possibilities, but also from making real changes. Our findings from the surveys conducted in all the five countries above show that established practice has delivered these developing nations with about the same level of capability in IT governance as is typically observed in the developed world.

The principles in ISO 38500 do not specify business leadership or engagement. However, the standard is clearly framed with a view to shifting the emphasis in IT governance from technical performance to business outcomes. As such, the standard begs engagement of business leaders: to take up responsibility; to formulate business plans that consider and drive the use of IT; to focus investment in IT on business outcomes; to set and achieve business performance targets for IT; to have consistent rules relating to the use of IT that are observed and respected throughout the organisation; and to ensure that the needs, behaviours and other characteristics of relevant human communities are understood and respected. Go into any organization today, public or private and ask one question: Who makes decisions about and manages the portfolio of IT investments? If the answer is "the business" then that organization is probably well on its way to good IT governance; but if the answer is "IT makes those decisions", the situation may be that governance is weak and suffering from a lack of proper leadership engagement. The importance of highly developed capability to govern IT, guided by ISO 38500 cannot be understated in this age of ubiquitous high speed broadband, where the user of information technology is a new dominant player, not just in information technology but in every aspect of society.

The challenge in each of these five nations, as is also the case in the developed world is to understand more deeply the factors that lead to the widespread weaknesses in governance of IT, and to develop the capabilities and behaviours necessary to replace this weakness with effective and robust capability that ensures an ongoing effective balance between cost, risk, opportunity and value.

REFERENCES

- Auditor-General. (2003). Review of Sydney Water's customer information and billing system. *Auditor-General's Report to Parliament 2003* (Volume One). Retrieved August 20, 2013, from publications/reports/financial/2003/vol1/SpecialRevSydneyWaterCIBS.pdf
- Australian National Audit Office. (2007). Audit Report no 24 2006-07, *Customs' Cargo Management Re-engineering Project*. Canberra, Australia: Australian National Audit Office.
- Australian Pharmaceutical Industries. (2006). Australian Pharmaceutical Industries and Its Controlled Entities ABN 57 000 004 320 *Annual Report*, 30 April 2006.
- Bart, C., & Turel, O. (2009). The role of the board in IT governance: current and desired oversight practices. *International Journal of Business Governance and Ethics*, 4(4), 316-328.
- Chalaris, I., Lemos, P.P. and Chalaris, M. (2005). IT Governance: The Safe Way to Effective and Efficient Governance. *E-Journal of Science and Technology*. Vol.1 Issue 1, pp.59-63.
- De Haes, S., & Van Grembergen, W. (2009). An exploratory study into IT governance implementations and its impact on business/IT alignment. *Information Systems Management*, 26(2) 123-137.
- Dell.com. "IT Governance Standards: Myth&Reality". Retrieved July 19, 2013, from www.dell.com
- Gartner Group. (2002). *Gartner Says 20 Percent of Corporate IT Budgets Wasted Globally in 2001 on Inefficient Information Communication Technology Spending*. Gartner Group Press Release, Egham, UK, 14 March 2002. Retrieved August 15, 2013, from http://www.gartner.com/5_about/press_releases/2002_03/pr20020314a.jsp
- Hair Jr., J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis*. (5th Ed.). NJ: Prentice-Hall.
- Hardy, G. (2002). Make Sure Management and IT are on the Same Page: Implementing an IT Governance Framework. *The Information Systems Control Journal*. Vol.3.
- Hayes, F. (2004). *Chaos is back*. November 08, 2004. Retrieved August 7, 2013, from <http://www.computerworld.com/managementtopics/management/project/story/0,10801,972800.html>
- Huff, S. L., Michael Maher, P., & Munro, M. C. (2006). Information technology and the board of directors: Is there an IT attention deficit? *MIS Quarterly Executive*, 5(2), [electronic version]. Retrieved August 10, 2013, from <http://www.misique.org/V0502-03.pdf>

International Organization for Standardization (ISO) <http://www.iso.org/iso/home.html>

ISO/IEC 38500:2008. Corporate governance of information technology. International Organisation for Standardisation, Switzerland, June 2008.

IT Governance Institute (ITGI) (2003). *Board briefing on IT governance* (2nd Ed.) Retrieved September 28, 2013, from www.itgi.org

IT Governance Institute (ITGI) (2006). *IT governance global status report 2006*. Retrieved September 28, 2013, from www.itgi.org

IT Governance Institute. (2007). *Board briefing on IT governance*. Retrieved August 7, 2013, from www.itgi.org.

IT Governance Institute (ITGI) (2008). *IT governance global status report 2008*. Retrieved September 28, 2013, from www.itgi.org

Johnson, E.C. (2005). IT Governance: New Players, Challenges and Opportunities. *The Information Systems Control Journal*. Vol.2.

King, W. R. (2007). IT strategy and innovation: The IT deniers versus a portfolio of IT role. *Information Systems Management*, 24(2), 197-200, Boston: Spring 2007.

KPMG. (2005). *Global IT project management survey—How committed are you?* Retrieved August 7, 2013, from <http://www.kpmg.com/au/aci/issues.htm#105>

Livingstone, R (2011) *Navigating through the cloud*, Sydney: RLA Advisory

Luciw, R. (2004). *RBC extends bank hours*. Retrieved August 20, 2013, from <http://www.theglobeandmail.com>

Luftman, J. (2000). Assessing business-IT alignment maturity. *Communications of the Association for Information Systems*, 4(14), 1-50.

Luftman, J. and Bullen, C. (2004). *Managing the information technology resource: leadership in the information age*. N.J. USA: Pearson/Prentice Hall.

McMurray, A. J., & Dorai, R. (2003, April). Workplace innovation scale: A new method for measuring innovation in the workplace. *The 5th European Conference on Organizational Knowledge, Learning and Capabilities (OKLC 2003)*. Barcelona, Spain.

McMurray, A. J., Cross, J., & Caponecchia, C. (2007, August 3-8). *Business continuity plan practices within the risk management profession*. Presented at the Academy of Management Meeting, Philadelphia, Pennsylvania.

McMurray, A. J., Pace, R. W., & Scott, D. (2004). *Research: A common sense approach*. Melbourne: Thomson Learning Social Science Press.

Mohamad, S. & Toomey, M. (2015), "The Importance of Enterprise Technology Governance in Effective Corporate Governance", in Tom Cockburn, Khosro S. Jahdi and Edgar G. Wilson (eds.), *Responsible Governance: International Perspectives for the New Era*, Business Expert Press, New York, USA, pp.155-184.

Nolan, R., & McFarlan, F. W. (2005). Information technology and the board of directors. *Harvard Business Review*, 83(10), 96-106.

Parent, M., & Reich, B.H. (2009). Governing Information Technology Risk. *California Management Review*, 51(3), 134-152.

PRO: NED. (2007). *Non-Executive Directors' Survey Report 2007*. IBM: NSW.

Read, T.J. (2004) Discussion of Director Responsibility for IT Governance: A Perspective on Strategy. *International Journal of Accounting Information Systems*. Vol.5, pp.105-107.

Schaper, M., & Volery, T. (2003). *Entrepreneurship and small business: A Pacific Rim perspective*. Brisbane: John Wiley.

Department of Public Service Administration (2012) (South African Government) *Public Service Corporate Governance of Information and Communication Technology Policy Framework*,

Standards Australia. (2005). *AS8015-2005—Australian Standard for Corporate Governance of Information and Communication Technology*. Sydney.

Standish Group. (1994). *The CHAOS Report*. Retrieved August 7, 2013, from http://www.standishgroup.com/sample_research/chaos_1994_1.php

Teece, D. J. (2002). *Managing intellectual capital* (pp. 183). Oxford: Oxford University Press.

Toomey, M. (2005). *A catastrophe in governance of IT: Australian customs integrated cargo system*. Melbourne, Australia: Infonomics Pty. Ltd.

Toomey, M. (2006). Achieving business sustainability: Director's perceptions of information technology investment, corporate monitoring, and governance. *Infonomics Newsletter Report*.

Toomey, M. (2007, August 13-25). Achieving business sustainability: Director's perceptions of information technology investment, corporate monitoring, and governance. *Presented at itSMF Australia National Conference, Melbourne, Australia*.

Toomey, M. (2009) *Waltzing with the Elephant: A comprehensive guide to directing and controlling information technology*. Melbourne, Australia: Infonomics Pty Ltd.

Toomey, M. (2012, April). Management vs Governance *The Infonomics Letter* March/April 2012 Edition: Melbourne, Australia.

Thorp, J. (2005, September 7). Meeting the challenge for IT-enabled change: A strategic governance approach. *Presented at the Committee for Economic Development of Australia (CEDA) Luncheon*. Melbourne, Australia.

Van Grembergen, W., De Haes, S., & Guldentops, E. (2004). Structures, Processes and Relational mechanisms for IT Governance. In W.V. Grembergen (Ed.), *Strategies for Information Technology Governance*. (pp.1-36). Hershey PA, London: Idea Group Publishing.

Van Grembergen, W., & De Haes, S. (2009). *Enterprise Governance of Information Technology: Achieving Strategic Alignment and Value*. New York, NY: Springer.

Weill, P., & Ross, J. (2004). *IT governance: How top performers manage IT decision rights for superior results*. Boston: Harvard Business School Press.

Webb, P., Pollard, C., & Ridley, G. (2006). Attempting to define IT governance: Wisdom or folly? *Proceedings of the 39th Hawaii International Conference on System Sciences*. Retrieved August 26, 2013, from <http://ieeexplore.ieee.org/iel5/10548/33368/01579684.pdf?arnumber=1579684>

Zhao, F., McMurray, A.J. and Toomey, M. (2008) Effectiveness of Information Technology Governance: Perceptions of Board Directors and Senior Managers in Zhao, F., *IT Entrepreneurship and Innovation*. Idea Group Publishing, USA. ISBN 978-1-50004-902-1 (eBook); ISBN 978-1-59904-901-4 (hard copy).

Zhao, F. (2006). *Maximize business profits through e-partnerships*. Hershey, PA: Idea Group Publishing.