Roles, Responsibilities and Futures of Chief Information Officers (CIOs) in the Public Sector

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Abstract
This paper discusses in its entirety, the CIO (Chief Information Officer) position in the public sector. Governments are increasingly adopting Information Technology for internal processes and for the delivery of service to their citizens. It includes literature on CIO roles and responsibilities which is heavily based on the private sector, due to the recognition of the role in this sector over twenty years. The position is just evolving in the public sector, and due to the context in which the public sector operates there are some similarities as well as vast differences. An evaluation of existing CIO models and theories form the basis for research on CIO roles, responsibilities and future within the public sector.

Keywords: *CIO, Chief Information Officer, Public Sector, CIO Roles, CIO Responsibilities*

INTRODUCTION
The role of the CIO in the public sector has become more prominent with an increased dependence of governments on Information Technology for internal management, delivery of services to citizens and meeting the demands of the digital environment. The CIO role within the public sector is still at a formative stage whereas in the private sector it is well developed. Combining this fact with the high CIO turnover rate in the Victorian Government (Department of Premier and Cabinet, 2006) in Australia, and the ever-evolving nature of IT, it became important to identify the opportunities and challenges of the position in the public sector. Even though Governments are seen as a whole enterprise, the departments within a government run rather independently with different visions, missions and goals in which the CIO is a position.
The Chief Information Officer (CIO), as an official role, has been present in organisations since the early 1980s. At this point in time, organisations are undergoing a revolution regarding information technology (IT). More and more money is being invested in information technology systems (ITS) and executives are becoming well aware of their competitors using information technology to gain a competitive advantage in an increasingly global marketplace (Porter and Millar, 1985). The private sector has been aware of such an importance and has been experiencing the benefits of the executive who manages the unique organisational asset, the Information Technology for over twenty years.
While private sector organisations were experiencing success with the implementation of the CIO in their organisational structures, the public sector had still recognises the new executive position. Australia has taken a lead in this and is among one of the first nations to appoint a WholeofGovernment (WoG) CIO (Bushell, 2006). Furthermore, Australia is considered to be leading the pack with regards to CIO implementation at all levels of government, and gaining

credibility and authority for the role (Bushell, 2006). What is interesting to note is that while private sector organisations were implementing CIOs from as far back as the early 1980s, Australia's WoG CIO was not appointed until June 2005 (Nairn MP, 2005), and Victoria was the first state level government to appoint a CIO in 2003 (Department of Premier and Cabinet, 2006). This means that the public sector is over twenty years behind their private sector counterparts in the appointing of an information executive.

The reticence in recognising the significance of a CIO appointment is also plagued by the high turnover rates in both the private and public sectors. In the public sector in particular, the instability created by such a severe turnover rate can only lead to the assumption that the role, which is still in the crucial infancy stage of development, has not been sufficiently implemented and aligned with the government's strategies and policies.

In this paper we describe the role of the CIO by discussing the responsibilities and future expectations of the role in a public sector setting. It includes literature on CIO roles and responsibilities which are mostly from experiences in the private sector. The paper concludes with the identification of research issues for this important emerging CIO role in the public sector.

LITERATURE REVIEW

The role of the CIO has only been established in the last twenty years and the amount of available literature on roles and responsibilities of the CIO reflects such a time frame.

Role of the CIO

Synnott and Gruber (1981 p. 66) first coined the term CIO in 1981 as the 'senior executive responsible for establishing corporate information policy, standards and management control over all information resources'. Hence, the CIO was described as a manager, and not just a technical expert. Since the CIO was an amalgamation of both the IT specialist and a management guru, the literature has identified several attributes that CIOs must have. According to Rockart, Ball and Bullen (1982) an important attribute is that of manager as well as technical expert. Other attributes include political, organisational and communication skills; involvement in, understanding of and experience in the overall management of the business; understanding of and ability to manage technological experts; development of appropriate human resource management skills; planning skills with particular importance on strategic planning and management of change; and sensitivity to the human, organisational and social impacts of new technology, and ability to proactively plan . This view indicates that the CIO is seen firstly as a management executive, and then technical expert. Passino and Severance (1988p 38) further corroborate the findings of Rockart et al. (1982) by suggesting that the new executive was firstly a business generalist and secondly a technology specialist. This confirms that the CIO role will always be associated with technological issues. Feeny, Edwards and Simpson (1992 p. 4445) advocate that the following are ideal for a CIO profile (Feeny et al.):

- 'Honesty, integrity, sincerity, openness';
- 'Business perspective, motivation, language''
- 'Communicator, educator, motivator, leader, politician, relationship builder';
- 'Continuously informed on developments in IT, able to interpret their significance to the business'; and
- 'Change oriented team player, catalyst to business thinking'.

The above attributes are in some ways similar to those first identified by Rockart et al. (1982) discussed earlier. The only component missing is the notion that the CIO must have the skills to be a manager of managers, which is acknowledged by Feeny et al. (1992).

Another description of the CIO by Remenyi, Grant and Pather's (2005 p. 6) is that of 'chameleon' with regard to their attributes and required skills. Four specific characteristics

identified are believed to be attributes of both the CIO and the chameleon. They are: ability to change; ability to see in multiple directions; to strike fast when required and the ability to hang on when the going gets tough. This description suggests that the role requires the ability to (a) adapt to a constantly changing environment, (b) able to envision the organisation in a holistic manner, (c) remain ahead of the game on technological development, and (d) endure the tough times when unrealistic expectations and failures occur.

From the discussion of the attributes and skills of the CIO it is apparent that the CIO, to successfully integrate with the organisations executive team, cannot purely be a technology expert, but must also have sufficient managerial skills. It is via the managerial skills that the CIO can effectively exploit the information technology within an organisation and gain credibility for further such investment.

Responsibilities of the CIO

The literature presents a variety of perspectives on what constitutes the responsibilities of the CIO. Rockart et al. (1982 p 4) identified the role as having three, increasingly significant parts: diminishing direct line responsibilities; increasing staff orientation; and corporate responsibility for information resource policy and strategy. Highbarger (1988) is of the opinion that CIO responsibilities entail cost effectiveness, technological competitiveness and organisation. They also contentious issues of the CIO role such as struggle for tenure, a lack of financial support, and determining value add from IT investments. Overall CIOs are required to have strong organisational skills, as at the end of the day they are an executive manager first and foremost.

Six long term areas of responsibility suggested by Stephens, Ledbetter, Mitra and Ford (1992 p 461) are: policies, procedures, guidelines or standards for information resources; strategic planning for information resources, linked to business planning, to provide improved organisation functions and competitive advantage; approval/acceptance of expenditures; coordination of information technology, functional units, environment; education of management, especially top management, on potential uses of technology; and environmental scanning. More recently, Polanksy, Inuganti and Wiggins (2004 p 30-1) identify CIO responsibilities to be IT strategy, IT governance, IT organisation and staffing, technology architecture, technology awareness, corporate governance, business intelligence, business transformation, customer care and Internet and e-business.

The above CIO responsibilities indicate that the CIO is an information technology and communications executive with finance and human resources as a flow on effect, not a driving factor. The above overview of the literature highlights the nature of the roles and responsibilities, and that the role has evolved considerably since its formation in the early 1980s. However, the future of the CIO role remains questionable.

Future for the CIO

There is very little literature envisaging the future roles and responsibilities of CIOs and the contexts of their operation. There have been several studies where the issues researched have been revisited to observe what has altered over a structured timeframe, and thus conclude by reaffirming the growing need of a CIO. Passino et al. (1988) indicated a bias to technology related issues with an emphasis on ability to communicate, train and educate management and users. Polansky et al. (2004) discussed the future addressing:

1. Responsibilities will continue to shift from technical/operational to a strategic/management focus;

2. The CIOs success will be redefined to encompass strategic, enterprise-wide business goals and objectives;

3. The focus of the CIO and the mission of IT will be redirected away from internal customers, and focused more towards external customers, partners, service providers and other links in the extended value chain;

4. Human capital management will become a key CIO responsibility;

5. CIO responsibilities will include IT portfolio management, IT investment management and risk assessment;

6. Business continuity and disaster recovery will continue to be seen as primary CIO responsibilities;

7. Actionable business intelligence will become a standard deliverable from IT;

8. Increasing importance on Governance will require the CIO to develop a deeper understanding and intuitive grasp of corporate finance and accounting processes;

9. CIOs will assume a greater leadership role with a focus on shaping and creating a world economy fuelled by information.

While at first glance the above list appears to redefine the CIO role, it is important to note that it takes into account the changing business and technological environment and then applies those factors to the role. In essence the role is campaigning for a change in attitude to IT. The role is asking executives to make IT an important component of business. This places an emphasis on the executive status of the CIO.

CIO Models

The literature describes many models to measure the effectiveness and success of CIOs in organisations. Following an analysis of the available models a comprehensive model relevant to the public sector is developed to guide future research on CIO roles, responsibilities and futures in the context of the public sector. The models analysed are discussed briefly in the following section.

Feeny et al's (1992) presented one of the first well-conceptualised models in literature, which aimed to observe the relationship between the CEO and CIO in order to determine the components of a successful two-way relationship. In this same model the CIO roles and attributes include career background and orientation, CIO conception of IT, business orientation and CIO's team. This identifies roles that a CIO is associated with, and some of the responsibilities a CIO undertakes. The model concurs with the literature discussed earlier regarding the attributes and skills of a CIO. IT only weakly reflects an area for forecasting the future of the role through the 'CIOs Business Orientation'. This model highlights some CIO attributes, however, its focus is the relationship between a CEO and a CIO.

Earl and Feeny (1995) identified several common areas that outlined where the CIO added value to an organisation including IT and business executive relationships, business imperatives, IS performance track record, a shared IT vision, business contribution beyond IT, concentrated IS development effort and external IS success stories.

This model includes some of the attributes from Feeny et al's (1992) model such as those related to business, however, it places too much emphasis on IS and IT.

Findings of an Australian study (Pervan, 1998) tested key information system management issues as they are perceived by CEOs and CIOs. The aim was to identify if there existed any commonalities in the issues importance levels. This study highlighted that CEO's are more concerned with overall business issues while CIOs are more responsible for IT issues.

Melarkode, From-Poulsen and Warnakulasuriya (2004 p. 46) focused on how CIOs can deliver agility within the organisation through the utilisation of IT. Discussion in the paper included an analysis of the old role of the CIO and how this has transformed into a new role for the CIO. Their model depicted the CIO as being uniquely positioned within organisations where "they increasingly have the opportunity to participate in corporate and business strategy planning and work across business units in identifying opportunities to improve value with IT. via IT". The model includes value creation from IT which is similar to the work of Earl and Feeny (1995) discussed earlier. Similar to the model presented by Melarkode et al. (2004), Capella (2006)

presented in his article a model depicting the dual role of the CIO which is as a technology expert as well as a strategic business partner.

As a result of the review of the literature, and the analysis of the models, similarities have been identified but the differences need further research.

CONTEXT

There is a great history regarding how the private and public sectors are viewed, and there are many varied opinions concerning the similarities and differences between the two sectors. In order to understand CIO issues, it is important to not only comprehend the components of the CIO, but to recognise and realise how and possibly why it has evolved differently in the private and public sectors. There are fundamentally three points of differentiation between the private and public sector, and these three areas help in understanding and defining the two sectors.

Private Sector

The private sector is made up of small, medium and large-scale organisations where ownership is held either by an individual or a group of entrepreneurs, more commonly referred to as shareholders (Budhwar et al., 2004). As a result of the ownership of private sector organisations, the funding for the organisation within the private sector comes directly from one of two sources: fees paid directly by the customer purchasing a good or service, or from shares purchased by shareholders in listed companies which signifies claim to part ownership and a share of profits. As such there is no claim for public funds in order for the business to operate (Boyne, 2002). The control within the private sector lies in the economy, or market forces (Boyne). Accordingly, the ability to perform, operate and succeed are constrained or imposed by market forces, such as barriers to entering new markets, exchange rates, interest rate fluctuations and the like.

Public Sector

The Australian Bureau of Statistics (1998) defines the public sector as "enterprises which the Commonwealth Government, State/Territory and local Governments, separately or jointly have control over. It includes local Government authorities and all Government departments, agencies and authorities created by, or reporting to, the Commonwealth Parliament and State parliaments." The public sector agencies are owned, funded and controlled collectively by members of political communities at different levels of government (Budhwar et al., 2004). Funding within the public sector is generated by taxes, where citizens at the Local, State and Federal level pay taxes to the Government in return for essential services (Boyne, 2002). Where market forces control the private sector, the public sector is subject to the imposition of political forces and the political system (Schneider et al., 1993), such as change of political party leadership.

Although the two sectors differ inherently in terms of ownership, funding and control, both the private and public sectors function similarly with regards to management (Schneider et al., 1993). For example, whether or not you are operating in the private or public sector, management still consists of establishing an organisational purpose, developing objectives, planning, managing and motivating the human resources, and controlling the organisation's performance both internally and externally (Schneider et al., 1993; Budhwar et al., 2004). The differences are in relation to time perspectives, performance measurement, media relations, authority, legal constraints, and personnel constraints. The three *internal* characteristics of the public sector however, that serves as clear points of difference are:

- More Bureaucracy: greater amount of formal procedures for decision making, and are less flexible and more risk-averse than their private sector counterparts (Bozeman et al., 1998; Farnham et al., 1996)

- More Red Tape: implies that the public sector operates with an unnecessary and counter-productive amount of rules, and relies more on rules and processes rather than results and outcomes (Boyne, 2002).
- Lower Managerial Autonomy: the public sector allows managers less freedom to react as they see fit to circumstances when they arise, which is exemplified by public managers' discretion over human resource issues which generally involves complex and time consuming processes to follow in hiring, firing and promotion, that, as a preferred alternative, is generally avoided (Baldwin, 1987; Boyne, 2002).

From the above it is appropriate to assume that the management of IS in either private or public organisations is both multidimensional and complex (Loukis et al., 2002). Literature discussed above on CIOs has been heavily focused on private sector studies. Very few studies have been conducted where the management of IT and IS issues has been raised in a public sector context. It is clear that more research is necessary in this area due to the critical role the public sector plays in the economic and social life of all countries, and also the growing realisation, reliance and importance of ICT on public sector productivity and effectiveness (Loukis et al., 2002). However, what is absent is academic literature on CIO from a public sector focus.

What little literature that is available with a public sector focus comes from CIO magazines and consultant reports. Whilst the value these articles contribute to the greater understanding of CIOs in government cannot be disregarded, their breadth and depth of information is inadequate considering the growing importance of the role in government and the vast range of academic literature available for its private sector counterpart.

As can be presumed from the type of information source, the majority of the articles from CIO magazines regarding the government sector discuss hot topics or contentious issues of the day. For the most part, the magazine articles discuss issues such as how public sector CIOs are the key players in the reinvention of government (Fabris, 1996; Fabris, 1998), the degree of scrutiny public sector CIOs face from the public they serve (Holmes, 2005), and even the public sector struggle to lure IT talent (Varon, 2000; Mayor, 2003). Most articles present bold issues that are indicative of the concerns CIOs in the public sector face, however, they lack the depth and draw on limited substantiative evidence.

To understand the roles, responsibilities and futures of the CIO in the public sector research is required. Figure 1 below is compiled from an extensive review of literature and an evaluation of models depicting CIO attributes to guide research on this topic.
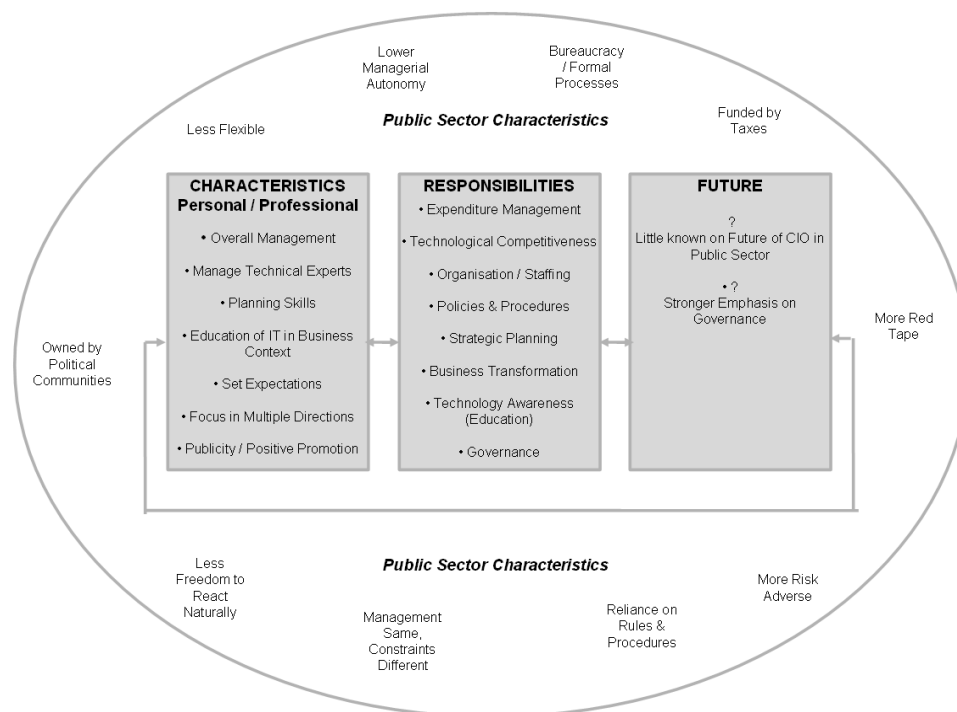
Figure 1:   Adapted Model for Measuring CIO in Public Sector

DISCUSSION

From the above discussion the striking difference between the development of literature from private and public sector is clear. The private sector has a twenty-year advantage over the public sector with regards to CIO role evolution, and it appears the advantage extends to academic literature. However, the literature available regarding CIOs has made one faux pas clear: the CIO is not a position that is exclusive to the private sector. The CIO is not an executive position that discriminates between organisations with regards to importance, regardless of being small or large in size, domestic or international in scope, or private or public sector based; the CIO is a critical executive.

Whilst it is recognised that there is valuable information to be gained from magazine articles regarding public sector CIOs, there are few studies available that are comparable to the academic studies of the private sector CIOs. There are of course no publicly available models that have been specifically developed for the public sector, nor is there cohesion surrounding the personal and professional characteristics, list of responsibilities and method for forecasting the future for public sector CIOs. Fabris (1998) clearly states that the role is evolving differently in different locations for the public sector CIO, and the CIO title can mean something quite different in different locations.

CONCLUSION

Chief Information Officer roles and responsibilities in the public sector are fast evolving due to the important role of ICT for government processes and electronic services. However, academic research is needed to establish if the role is beyond that of the private sector, is restrained by the context in which it operates and the future of the position.

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