Asset Management and Governance: Analysing Vehicle Fleets in Asset-Intensive Organisations

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Abstract

For physically asset-intensive organisations asset management processes and intervention strategies are considered a crucial element, as there is heavy reliance on optimal performance of assets in order to maximise organisational performance and business goals. There is a tendency for traditional asset management practices to concentrate on the engineering or operational performance of the assets, taking for granted governance factors which views asset management through organisational-level lens.

Asset governance is a radically new way to view ownership and management of assets in a competitive and deregulated market, an innovative solution to meet the regulatory and increasingly competitive challenges faced by modern utility companies. Asset fleets provide a relevant and important context to investigate the interaction between engineering and governance views on asset management as fleets have distributed and system characteristics. This paper investigates how engineering and governance perspectives of asset management can be reconciled and integrated to enable optimal asset and organizational performance. Preliminary findings of a pilot study identifies issues in asset management process and localized understanding of governance within different organization divisions as the main challenges in asset management-asset governance integration.

Keywords: Engineering asset management, asset-intensive organisation, asset governance, integrated perspectives, asset performance

Introduction

Asset-intensive organisations such as utilities, heavy engineering, mining, or transportation rely for their operations on assets that are expensive, extensive and/or complex, and have a major impact on organisational performance over extended periods (Jabiri, Jaafari, Platfoot & Gunaratram 2005; Lin, Gao, Koronios, Shanana 2007). The management of these organisations entails the reconciliation of potentially divergent objectives. On one hand, generating satisfactory economic performance from the assets requires the integration of operating processes that encompass the whole-of-life of the assets (Maheswari 2006). On the other hand, asset –intensive organisations are usually government – or publicly owned and as such have to follow governance rules imposed by their environments.

Maintaining and increasing the level of economic performance and growth is essential for many public and private enterprises. Such a goal is often linked to the performance of the organisation's asset, both tangible (human and physical) and intangible (technology, tacit knowledge, and capital) assets. The process in which organisations manage both its tangible and intangible assets is recognised as asset management (Cromwell and Speranza 2007; Davis 2007). Asset management is a process recognised in many fields, including engineering, information technology and information management systems, financial services and human resources. It is also a common term used by utility providers and infrastructure providers (Woodhouse 2006b). Asset management is pivotal to the performance and growth of an organisation, where effective management is essential to maximise utilisation of an asset during its lifecycle. Therefore it is crucial to understand the process and reasoning behind policies and decisions made regarding the management of assets mentioned above.

To do so there is a need to analyse and identify a governance structure that will support the successful application of asset management. Governance can be defined as the laws, policies, and procedures that ensure organisations run in the interest of owners and resources are allocated, managed, and redeployed to maximise productivity and value (Alles, Datar and Friedland 2005). Governance assists in determining management processes, organisational structure, and incentives structure that ensures and induces high economic performance level and growth. An aspect within governance defines the processes in which assets of the organisation are to be acquired, maintained, and accounted for (Cornish and Morton 2001). Hence it is crucial to utilise governance as an analytical tool to assess current asset management practices. Therefore this paper focuses on addressing the combination and bridging of asset management and governance, to create an asset governance practice that will address the challenges of current asset management practices in an attempt to increase asset performance levels.

Research in current asset management practices has voiced the need for improved practices that will increase efficiency and effectiveness of assets, increasing its performance value. In particular for physical assets suggestions include a more streamlined decision making process in regards to the asset life-cycle, a higher return of investment, higher level of accountability and transparency in asset reporting, and the introduction of an incentive and penalty system for asset users. As a response to the many corporate collapses and exploitative public sector practices, research in governance has advocated a business process that is transparent, accountable, and participative in decision making process, and in accordance to international industry standards.

This raises questions on possible overlap and cause-effect relationship between the two concepts, where convergence of certain aspects and structures from each concept is anticipated to create a framework that will support management processes. This possibility has been discussed many scholars, where it is referred to as asset governance (Cornish and Morton 2001; TWPL 2007; Woodhouse 2004; Woodhouse 2006b). Asset management literature has its roots in the engineering and mechanical field and thus it tends to focus on the operational side of the asset life-cycle. Although asset management has been high on the research agenda in recent years its advances in the area of business processes and strategies are limited. As a result the two fields of asset management and governance have traditionally been treated as separate research tracks. In this research asset management and asset governance are considered together to investigate how operational and organisational approaches to asset management can be contrasted. Since asset governance is considered a new and innovative concept, existing research in this field suggest an insufficiently developed conceptualisation and application of the new concept. Hence it is necessary to build on current research, further develop asset governance concepts, and further investigate its application within asset-intensive organisations.

Previous research on asset management practices shows abundant discussion in fields such as human resources management (Abendschein 2004; Burgelman and Sayles 1986; Nesbit 2006), digital asset management (Binder 2006; Comerford 2006; Halfawy, Vanier and Froese 2006; Horodyski 2006; Kotrch 2005; Schupp and Krishna 2006), operational asset maintenance (Cromwell and Speranza 2007; Doucet 2005; Guggenheim and Stahr 2006), financial services (Chowdhury 2006; Hlawitschka and Tucker 2006; Jacobs 2005; Platen 2006), and network associations (Johnson 1999; Kale, Singh and Perlmutter 2000; Mohr and Spekman 1994). This research addresses an important gap in asset management research, moving away from the traditional engineering and technical management of assets and addressing governance structures that underpin effective processes in managing assets. Therefore there is a shift in focus, concentrating on asset life-cycle reporting requirements, accountability for assets, decision making process, and communication between asset users and asset management policy makers (Woodhouse 2004). Thus this research will develop theories and models that complement existing engineering and technology based approaches, and is crucial for asset-intensive organisations as a benchmark input in order to improve asset management practices in a bid for increased asset performance.

Current research indicates keen attention on how governance structures and asset management are applied in the private sector (Barber, Munive-Hernandez and Keane 2006; Matichich, Allen and Allen 2006; Mir and Seboui 2006), suggesting the need for further investigation within a wide range of asset-intensive organisations – both private and public. Hence asset-intensive organisations are the main focus of this research, where it is further concentrated on the comparison between cross–industry organisations that relies on a common physical asset. This research will focus on one specific asset class – vehicle fleets – in order to meaningful analytical results and provide opportunities for inter-organisation comparison.

This investigation involves a study of asset-intensive organisations, adopting a series of in-depth comparative case studies approach. In-depth comparative case studies is chosen as a methodological approach as it serves the purpose of answering explanatory (how or why) research questions (Stake 2005). Such an approach provides more compelling evidence and lead to robust research (Yin 1994) because it enables researchers to replicate methodology across cases and compare and contrast results (Rogelberg 2002). A mixed method of quantitative and qualitative analysis is employed on each case study to provide triangulation

and rigour (Eisenhardt 1989; Hall and Rist 1999; Janesick 1994). Such a method includes document analysis, in-depth interviews, and quantitative analysis of metrics of operational and financial performance.

To allow asset-intensive organisation design an asset management system that will answer current challenges there is a need to implement a design method that addresses all of the contingency factors associated with asset management system of the organisation. Therefore a significant contribution of this research will be the development of a theoretical contingency-based model for balanced asset management systems that has application in large multi-divisional asset-intensive organisations.

Preliminary Literature Review – Asset Management and Asset Governance

Asset management is considered to be a fundamental element in an organisation's operations as efficient allocation and management of resources are crucial in order to maximise performance and fulfil strategic goals. Many definitions of asset management exist (Mitchell and Carlson 2001; Wenzler 2005; Wittwer, Bittner and Switzer 2002; Woodhouse 2006a), however there is a broad consensus to recognise asset management as the process or cycle in which assets are "put through" in order to create a product or provide a service at optimum level. Though the process varies between organisations, asset management generally starts as early as identifying the need for a new asset. This is followed by writing asset specifications, forecasting financials related to the asset, predicting its life cycle, acquirement of asset, maintenance of assets, reporting of assets, and disposal system for assets. Organisations may also adopt intervention strategies to manage the economic life or their assets and slow the wear-out process to get as much value as possible out of them (Cromwell and Speranza 2007).

Asset management research in the past has concentrated on engineering and technical management theories, with an emphasis on the operational side of asset management. In terms of a physical asset, for example a piece of machinery, this means intervention practices in the form of maintenance regimes to ensure maximum usage of the asset. Effective disposal of the asset is also considered an important part of asset management due to organisations aiming for maximum return in its investment. It is recognised that there are two asset categories within an organisation; physical and non-physical. Non-physical assets are likened to human resources, as their expertise, knowledge, and capabilities are crucial in the smooth operation and performance of the organisation. Therefore asset management can also refer to the effective management of employees, or otherwise known as human resource management. This concept concentrates on how organisations can create an atmosphere and working conditions that will induce maximum performance from its employees (Abendschein 2004; Crisp 2002; David 2003; Neuwirth 2004; Nmom 2004; Storberg-Walker 2004).

With the introduction and increasing popularity of higher level technology, digital information and intellectual property are also recognised as an important asset for an organisation. This saw the introduction of digital asset management (DAM), where organisations classify digital information and technical capabilities as assets (Stokes and Seers 2005; Warwick 2006). This led to an abundance of literature on how to manage digital information effectively and protect them in order to gain competitive advantage (Binder 2006; Comerford 2006; Holm 2006; Horodyski 2006; LeBoeuf 2006). Asset management can also refer to the management of network associations (Yee and Platts 2006), where the potential importance of close relationships in a network is considered to be a strategic asset for the organisation (Johnson 1999; Kale et al. 2000; Mohr and Spekman 1994). The close co-

operative relationships in a network can help firms gain new competencies, conserve resources and share risks, move quickly into new markets, and create attractive options for future investments (Morash and Clinton 1998; Peck and Juttner 2000). Asset management literature is also popular within the financial services field, where it is conceptualised as a service activity that provides professional money management services to individual and institutional investors, in particular how to manage investment vehicles (Chowdhury 2006; Hlawitschka and Tucker 2006; Jacobs 2005; McIver 2005; Platen 2006).

Although asset management can be applied in many fields and have a vast interpretation a main link exists. Each asset management concept and application (within different fields) shares the common theme of strategic importance, systematic processes, optimising efficiency, maximising performance and output, and minimising risks. However, as pointed out by Woodhouse (2006), asset management research and implementation has so far concentrated on the execution of activities that are considered to be asset management, without much thought or insight on the policy and governance structures that define, regulate, and control the execution of such activities. Therefore governance issues which detail the underlying structure of how assets should be managed from a business or management point of view have so far been ignored. This research will attempt to address this major gap by investigating how governance structures and policies impact asset management.

As mentioned above asset management research originated from the maintenance of physical assets. However research in this area is limited to certain industries, such as water (Kitchen 2006; Matichich et al. 2006; Mergelas 2005) and electricity providers (Cornish and Morton 2001). Therefore the findings of these researches were tailored to particular industries and conditions, suggesting limitation in the generalisability of findings. This suggests there is a need for research that addresses a common physical asset across different industries to enable a compare and contrast of best practice and formulation of an asset governance framework. Industry practitioners have advocated for a standard in carrying out asset management that is applicable to any organisation where physical assets are a key or critical factor in achieving effective service delivery. This is evident in the United Kingdom through the Publicly Available Specification for Asset Management (PAS 55) published by the British Standards Institutions (Farrell and Davies 2005; TWPL 2007; Woodhouse 2004) and in North America though the publication of Roadmap for Fleet Managers as published by the National Association of Fleet Administration (Golubski 2002). Although both standards exist its application is geographically limited and only concerns the private sector.

It can be concluded from the above paragraphs that there is currently a gap within asset management theory and an increasing need for standardised asset management practice. It has also been identified that there is a need to investigate the structure and reasoning behind asset management practices in order to understand the “whys” and improve asset management practices. Hence it is obvious that there is a need to address the governance side of asset management, investigating how organisational structure and strategies affect asset management practices and how governance principles can enhance asset management practices. Early investigation in this area exists, evidenced by the formulation of asset governance (Cornish and Morton 2001).

Asset governance can be defined as a radical new way to view the ownership and management of distribution systems in a competitive and deregulated market. By advocating an asset management practice that is more transparent, accountable, aligned to organisation strategy, and long-term focused, asset governance opens the way forward for real competition

to be introduced in the development, stewardship and operation of assets (Kitchen 2006). Clear definition and differentiation of roles and responsibilities of the asset owner, asset governor, and the service providers for operational and maintenance activities is central to asset governance (Cornish and Morton 2001) Thus asset governance emphasises the separation of powers in asset management to increase value through effective management and exploitation of assets.

Comparison of asset management and asset governance literature show certain overlapping areas, where it is possible for one to confuse the significant difference between one and another. One of the main overlap between the two concepts is that both advocate for a system that will maximise the performance or utilisation of an asset while minimising risk factors. Both concepts also stress the importance in strategic planning and integrating asset-related decisions with organisational/business goals, whilst ensuring equal or higher return on investment at the same time. Minimising cost, or total asset life cycle cost, through careful acquisition, maintenance, and disposal policies is also an area in which asset management and asset governance overlaps. Therefore it is understandable for one to confuse one for the other, or use the two terms interchangeably.

However there is a fundamental difference between the two concepts. Asset management refers more to the operations of how asset will be managed – how they will be acquired, maintained, and disposed in order to maximise performance and return of investment. Asset governance on the other hand concentrates on the reasoning for a particular policy, transparency and accountability in writing and implementing of the policy, and intervention strategies to ensure effective implementation of the policy. Therefore the main link between asset management and asset governance is that asset governance provides the policy structure which determines the space for asset management implementation. Comparing literature on both asset management and asset governance it can be concluded that the difference above can be separated into eight categories. These eight categories show the obvious difference between the two aspects. This suggests differences in the interpretation and scope of many areas, as illustrated in table 1.

Table 1. Differences between Asset Management and Asset Governance

	Asset Management	**Asset Governance**
Focus	Engineering, IT, mechanical operations	Policy structuring, the process of developing underlying rules & regulations, aligning operations with business goals
Compliance	Technical specifications and standards	Industry regulations and rules, international standards and benchmarks
Authority (separation of power)	Asset Manager	Asset Governor
Time Frame	Short term	Long term
Application (scope of)	Operational or divisional level	Corporate level
Competitive process / edge	Cutting edge specifications Proactive maintenance and operational risk management	Business level strategies – procurement processes and proactive risk management
Implementation	Technical and business	Organisational change, local

barriers	capabilities	management personalities, organisational structure
Planning focus	Operational /physical planning	Decision making process

As evident in table 1 there is a difference in focus between asset management and asset governance. Asset management have the tendency to focus on the engineering and operational side within an asset's life cycle. In terms of physical assets this focus suggests an asset management regime that is highly concentrated on writing technical specifications, acquiring the asset based on technical specifications, technical maintenance to ensure maximum performance of the asset, and a disposal system that will ensure equal or high return of investment. Asset governance on the other hand concentrates on the process underlying rules and regulations development, ensuring alignment of asset operations to business goals/strategies. Asset governance emphasise the how and why asset-related policies are developed, especially in ensuring policies are developed in alignment with organisational strategy and goals. Asset governance is also focused on how the organisational structure can support effective asset management practices, especially by creating a more streamlined decision making process and clearer lines of responsibility (for the asset).

In line with the difference in focus between asset management and asset governance, there is a difference in the "standard" that each concept adheres and evaluates themselves against. Due to its engineering/operational focus, asset management refers to the compliance against technical specifications, health and safety standards, and any other operational industry standard. Such a compliance evaluation is executed to ensure that the physical assets acquired are fit for use and will ensure high level performance. Asset governance on the other hand ensure the organisation is in compliance with business related industry regulations and rules, and international standards. An explicit example of the difference between the two is that while asset management concentrates on whether or not a physical asset fulfils technical specifications (such as colour, kilometres recorded, engine cylinders), asset governance ensures reporting of the physical asset (cost, utilisation, etc) is executed in a standardised manner across the organisation and is available upon request for audit.

One of the main differences between asset management and asset governance according to Cornish and Morton (2001) is the separation of power between an asset manager and an asset governor. The asset manager is primarily concerned with developing the network in line with any contractual conditions and their impact on any risk/rewards mechanisms. This person is responsible for understanding business costs and performance drivers, determining investments to optimise performance and operational costs, managing the delivery of network performance, managing the delivery of investment programmes, monitoring asset conditions, and devising appropriate maintenance policies. Hence the asset manager needs to able to balance medium term strategy and the day to day performance management. Once of the difficulties in a traditional organisational structure is balancing asset managers' demands with those of reducing day to day operational costs. In establishing as asset management service provided and an informed client, the latter is in a position to consider the longer term governance of the assets in more detail and to take a more strategic overview. This leads to the role of an asset governor, who takes a more long term strategic view of the assets and assesses their impact on commercial, statutory, and regulatory requirements. An asset governor provides a skill set that comprises of understanding the lifetime performance and ownership costs of physical assets, understanding the business risk model and the balance between investment and performance, determining a high level overall investment strategy to

create and release value, understanding the position of the business in relation to performance and efficiency frontiers, manage competitive procurement process, and identify other opportunities to generate value from the use of assets. Therefore an asset governor's main goal is regulatory compliance, supply business satisfaction, and income maximisation and generation.

The above description of asset manager and asset governor roles suggests there are possible overlaps, and sometimes conflicting, functions/areas. One of the key differences between the two roles, which also lead us to the next difference between asset management and asset governance, is the time frame focus in which strategies are developed. The asset manager is more concerned about day to day operational matters and medium term strategies, whereas the asset governor's planning horizon is more long term. As well as a difference in the time frame of planning, there is also a difference in the planning focus. Cornish and Morton (2001) recognise a main challenge in separating the two functions, namely confusion in the line of responsibility and authority. It is possible for asset users and other asset related employees to be uncertain of whom they should report to.

The description of asset manager and asset governor above, along with their difference in time frame of planning, leads to the difference in the scope of application between asset management and asset governance. It is clear that asset management has the scope of operational or divisional level, concentrating how each division of asset users coordinate and communicate in order to maximise physical asset performance. As asset managers have a day to day operational and medium term planning time frame, their focus is restricted to engineering/mechanical operations of the physical asset. Asset governors meanwhile have a planning focus that is concentrated at ensuring asset related activities that are most efficient whilst also maximising returns. Hence asset governance has a larger scope in terms of strategies at the corporate level, where there is an emphasis on how physical assets can be utilised to meet business goals and create further value for the organisation.

Asset governance application is currently evident in the United Kingdom through its Publicly Available Specification for Asset Management (PAS 55) as developed by the British Standards Institution (TWPL 2007; Woodhouse 2004; Woodhouse 2006b), especially in the electricity industry (Cornish and Morton 2001; Farrell and Davies 2005; Kitchen 2006) and gas distributors industry (Woodhouse 2006b). It is recognised that similar opportunities exists in other capital intensive industries, such as railroads and airports (Cornish and Morton 2001), however there is a dearth in literature concerning physical asset management in both industries.

The PAS 55 first emerged in February 2002 through the British Standards Institute to clarify and define a standardised meaning for physical asset management system. This was deemed necessary as many directors, analysts, and asset managers have diversified views to what is the meaning of physical asset management and what it entails. The PAS 55 defines physical asset management as a system that requires a life-cycle view and optimal mixture of capital investments, operations, maintenance, resourcing, risks, performance, and sustainability; where it is deemed a necessity for industry regulators to utilise it as a checklist of good governance (Woodhouse 2006b). Key asset governance principles are embodied within PAS 55; involving functions such as regulatory compliance, supply business satisfaction, risk-based, data supported, continuous improvement, pragmatic, and income maximisation and generation (Cornish and Morton 2001; Woodhouse 2004).

Asset governance is still considered a new concept, its introduction and application within organisations is evidently at early stages. This is evident in the early asset governance literature discussing the concept, both theoretically and its application, for example in certain industries such as electricity (Cornish and Morton 2001; Woodhouse 2006b) and water (Guggenheim and Stahr 2006). Therefore there is a need to explore asset governance in greater depth; investigating possible integrations between asset management aspects and governance structures, applicability within an organisation and across different industries of asset intensive organisations, contingency factors that needs to be considered in formulating policies, and implementation plans that are consistent with other related business system standards and will facilitate its alignment or integration (TWPL 2007). It is suspected that from the assessment of asset governance principles on asset management practices a number of challenges will be identified. These challenges are directly correlated to practices that will result in a more efficient and effective asset management practice. Although asset governance provides the platform in identifying challenges for improved asset management practices, it doesn't provide a methodology in answering those challenges. Therefore there is a need for research that calls upon other theories to answer such challenges.

Research Question

This research concentrates on investigating the application of governance principles on asset management practices, in a bid to bridge asset management and asset governance concepts and create an improved asset management practices. As discussed in the literature review there is a dearth in literature investing asset management practices from the business/organisational perspective, and although literature exist in the area of asset governance it is still at infancy stage and needs to be further developed. Each of the relevant concepts from the two fields (asset management and asset governance), and its possible co-existence, needs to be tested and validated in real industrial settings. This calls for an investigation that involves comparative case studies of a common physical asset within physically asset-intensive organisations, in order to identify asset governance contingency factors that have high level of generalisability.

Therefore this research questions the extent and type of governance necessary within an asset management system in asset-intensive organisations to ensure its performance efficiency. An overarching question to the research is: How can an improved asset management system maximise asset performance within a physically asset-intensive organisation? Sub-questions to assist in developing a response to this question are identified below;

- What are the identical contingency factors between asset management and asset governance?
- What business/organisational challenges are derived from current physical asset management practices?
- What are the common asset governance contingency factors between different fleet management practices industries of physically asset-intensive organisations?

Methodology

In devising a way to seek answers to the main research question and four research sub-questions outlined in the "research question" section the following issues were considered:

1. In order to answer the first question it is desirable compare asset management processes and governance structures within an organisation, with the aim of identifying identical and contrasting contingency factors of both concepts. To achieve

this there is a need to compare literature on both concepts, interview organisation employees involved in asset management division and business units, and cross reference interviews from both sides. This method not only serves the purpose of answering the first question it can also be utilised to answer the second question.

2. Within an asset-intensive organisation different levels of management exist in relation to physical assets, wherein each level has a different level of responsibility in relation to the physical asset. This ranges from physical asset users to asset related policy makers. Therefore there is a need to include asset-intensive organisation employees in the research as they are the people who are directly related to the management of physical assets.
3. In order to conclude common asset governance contingency factors between fleet management practices across a range of different asset intensive organisations there is a need to perform a comparative analysis of multiple asset-intensive organisations that have one physical asset in common.

Based on the criteria above a two phase design advocated by Bower (1986, p.27) is adapted. Phase 1 involves case study field work with three data collection methods, with the purpose of addressing criteria one and two. Phase 2 of the project involves a series of parallel studies, within the framework of a benchmarking study of asset intensive organisations – with the purpose of addressing the third criteria.

Phase one of the project involves case study research format, where each asset-intensive organisation is treated as a case. Case study format is deemed to be the most suitable as case studies optimises understanding through pursuing research questions, gaining credibility by triangulating descriptions and interpretations gained during the study period (Stake 2005; Drisko 1999; Roche 1997). Each case will focus on investigating the organisations' current asset management practices, governance structures, innovation temperature level, and best practice "tailor made" asset governance application.

To enable a thorough investigation and answer the research questions posed there is a need to utilise both quantitative and qualitative methods. As explained by Hall and Rist (1999) and Cavana, Delahaye and Sekaran (2000) quantitative analysis provides a methodological approach that results in a statistical overview of findings (to the research problem) whereas qualitative analysis provide the vehicle to strengthen this overview. This view is further strengthened by Bloor (1997) and Drisko (1997), where qualitative analysis is deemed to provide a deeper explanation to the numbers produced by quantitative analysis. Hence qualitative and quantitative methods supplement each other by providing additional insights to achieve contextual triangulation and increase the validity and rigour of research (Eisenhardt 1989; Yin 1994).

This suggests a data collection method that involves multiple specific methods within one case study (Hall and Rist 1999; Janesick 1994). Hence a series of in-depth comparative studies is deemed to be more appropriate (Rogelberg 2002; Yin 1994), involving in-depth interviews with managers, descriptions of governance structures and modes of operating the assets, and metrics of operational and financial performance. As mentioned above the methodological approach taken is case based analysis, where although both quantitative and qualitative approaches are utilised there is a heavier qualitative component. Asset-intensive organisations' employees' involvement is considered key to the research as they are considered to be the implementers of policies, thus have a direct effect on management

processes. Therefore not only will findings be based on statistical analysis of physical assets related data, it will also be sourced from physical asset users and policy makers.

The first stage of document analysis runs in parallel with analysing descriptions of governance structures and modes of operating assets, as there is a high possibility that governance structures and asset management practices are documented within a firm's reports. One of the main purposes of this method is as a sense-making activity on current governance structures, organisational structure, asset management practices, organisational innovations, and statistical information regarding organisation assets (Guggenheim and Stahr 2006). Sense-making method is considered crucial at the beginning of the data collection process as it allows the researcher to understand the organisational culture and structure, current management processes, and current issues and challenges (Hodder 2003; Michael and Pauric 2006; Margaret 2001; Betts, Pingree, Amos, Ashbrook, Fox and et al. 1989). This method will also allow identification of issues that requires further clarification and exploratory research, which will induce questions for the next method (Jonathan 2003). Also this method will allow a preliminary compare and contrast of current governance structures and asset management strategies between asset-intensive organisations (as case studies), providing a springboard for possible best practice asset governance application.

The next method is semi-structured interviewing, which is carried out in each asset-intensive organisation's office involving employees of asset-intensive organisations. Semi-structured interview is crucial in this research as it is a vehicle to greater understanding of employee's views on asset management processes, where the nature of semi-structure interviews still allow for flexibility in information extraction through open ended questions (Bowler 1997; Holstein and Gubrium 1995; Miller and Crabtree 2004; Willis 2005). Executing semi-structured interviews in asset-intensive organisation's offices will also allow observation of day to day procedures (Dingwall 1997; Angrosino and Perez 2003), which will strengthen validity of data collected from individual in-depth interviews.

As mentioned in the paragraph above employees of asset-intensive organisations are involved in the semi-structured interview process. It is advocated that the semi-structured interview process will involve both employees of specific asset management division (for example fleet management division) and business/organisational divisions (which include corporate core division of the organisation). The reason that this is advocated is to find the common contingency factors between asset management and asset governance in practice. Therefore it is crucial for interviews from different divisions to be cross-referenced in order to find commonalities between both concepts. It is also necessary to cross reference interviews between employees of the same division to investigate if there is an aggregated divisional opinion or if there are any discrepancies in opinions. An interview structure that portrays the organisational structure provides a 'compare and contrast' of perspectives between levels of organisational structure, teasing out possible contrasts between each level in a loop feedback in which opinions from one level will be fed to other levels (Chase 2005; Holstein and Gubrium 1995). Therefore it is advocated that for each division employees of different level within the organisational structure is interviewed. The use of multiple levels of interviews, or "triangulation" within a method (Denzin 1984; Patton 1987) allows the researcher to crosscheck results thus ensuring that the data generated are not simply artefacts or the opinion of one specific data source (Jick 1979). It is anticipated that contrasts in opinions exists, which will provide a platform for further analysis on potential mismatches between policy and implementation – suggesting a possible framework for innovation in current asset management strategies and governance structures.

The last stage of data collection involves quantitative measures, whereby metrics of operational and financial performance will provide the quantitative analysis side of this methodology. This stage will involve quarterly and annual report statistical data, stocks of assets data, fleet utilisation data, efficiency measures, and financial data as the main source of information. These data are analysed to find a correlation between certain asset management practices and its financial performance value, in an attempt to identify best asset management practices that will increase financial performance. This will enhance findings from the interview stage by providing an illustration of asset management practices impact in real figures.

Phase two of the methodology design involves a comparative study of asset-intensive organisations. To achieve comparable results across asset-intensive organisations this study will focus on one class of fixed assets that is common across various types of asset-intensive firms: vehicle fleets. Vehicle fleets and fleet management is chosen as the case study exemplar in this research as it had been recognised that within fleet management there is a separation between asset owner, asset manager, and asset user (Cornish and Morton 2001). Not only is this consistent with the main concepts of asset governance (TWPL 2007; Woodhouse 2004; Woodhouse 2006), early research on asset governance application by Cromwell and Speranza (2007) also utilised utility assets and vehicles to illustrate asset governance concepts; hence strengthening the reason for focusing this investigation on vehicle fleets.

As comparative study and field observation approach does not support the justification of a single observation (Bower, 1986, p.25) this study plans to build a sample of minimum four to a maximum of six cases of asset-intensive organisations entities across industries to ensure robust external validity and enhance generalisability of findings (Golden-Biddle and Locke 1997; Zikmund 2000). Industries include railways, electricity, water, and telecommunications utilities; both in national industries (Australia) and international industries/collaborations. During the execution of phase two data collection methods applied in phase one will be applied to ensure rigour. As this phase is designed as a compare and contrast exercise, best practice in physical asset management system is anticipated to be the result.

Preliminary Findings

This project is associated with a CIEAM (CRC for Integrated Engineering Asset Management) project entitled “Asset Performance: Impact of Stewardship and Governance Strategies. Through this association the student is able to access data collected between CIEAM and Queensland Rail collaboration, utilising it as a pilot study for this research. The methodology designed above will be applied on Queensland Rail as a pilot study for several reasons. Firstly it will scope the research project to assist in developing research hypotheses and refining research questions. Secondly it tests the methods proposed in terms of efficiency and effectiveness in extracting useful information, providing feedback for revision of methods. Thirdly information extracted from the pilot study will assist in developing a preliminary decision making tool and contingency model for structuring asset governance, which will be tested both on Queensland Rail itself and other case studies.

Queensland Rail (QR) is one of Australia’s largest passenger, coal and freight transport providers and has already been operating for over 141 years. QR is among Australia’s longest serving enterprises. As a publicly owned organisation, QR is subject to the provisions of the

Transport Infrastructure Act of 1994 and the Government Owned Corporations Act of 1993. Its shareholders are represented by two Ministers – the Minister of finance and the Minister for Transport and Main Roads. Today QR moves more coal and freight than any other organisation in Australia and provides passenger services for over 54 million people living, working and travelling throughout Queensland. Through its 9,500km rail network, QR is a major provider of rail freight solutions, with integrated service offerings across road and rail (QueenslandRail 2006).

As a result of the growth of the company over the years, the level of complexity of the internal relations between groups, divisions and units has grown considerably as well. QR is structured in six different groups;
- QRNational for coal, bulk logistics transport and general freight business
- Passenger Services for commuter long-distance passenger transport
- Infrastructure Services Group (ISG) for the construction, maintenance and management of the rail network
- Network Access for managing the Queensland railway network including access to it and the operations on it
- And the Shared Service Group (SSG) for the internal business support across QR and within the SSG the Rollingstock and Component Services (RACS) for the heavy repair and overhaul of most of QR's rolling stock fleet. (RACS is officially presented as a separate group, but in practice is a division under the SSG)

QR is governed by a central Corporation Core that dictates the strategy, policy and governance. Every group itself is broken down into divisions, which on their turn are broken down in Units. In Figure Error! **No text of specified style in document.**-1 an overview is given of QR and its Groups. To the right is the Shared Service Group (SSG) with the Supply division and the Rollingstock and Component Services (RACS) and Fleet Services (FS) units.

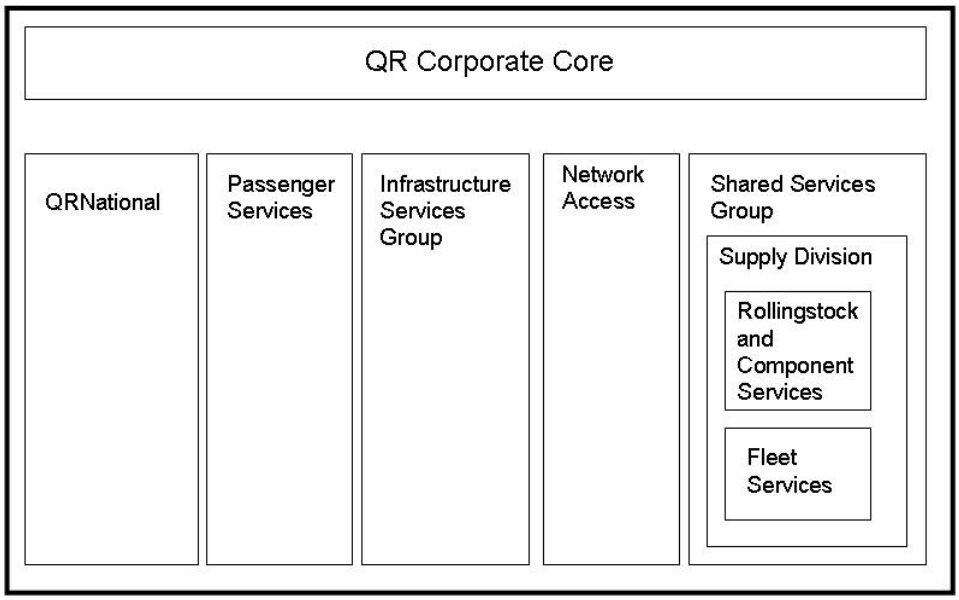

Figure Error! No text of specified style in document.**-1: An overview of QR with the six Groups**

However, the Australian transport industry is changing rapidly and QR, as a commercially driven organisation, must ensure it is well positioned and efficiently driven, to compete in the market with the other transport companies. As such, QR's focus is to continuously expand its coal, bulk and general freight businesses nationally; and at the same time increase market

share and continue to build its passenger services business locally. In order to keep up with the changing industry it is important for a corporation like QR to operate as efficiently as possible to keep its competitiveness and attractiveness for its customers.

In this effort to expand and become more competitive even outside Queensland, QR purchased the Australian Railroad Group (ARG) in 2006 as mentioned before. ARG used to be one of Australia's largest private rail operators that began operating in Western Australia in 2000 and used to be part of the international rail operator Genesee & Wyoming Inc. With the purchase of ARG, QR did not only gain 5000 kilometres of railroad track in WA, but also an efficiently operating railroad group that was outperforming QR on several points.

One of the major differences between ARG and QR, and the one most important for this case, is the difference in operating the service fleet. (These service assets exist of: Passenger/light commercial vehicles, trucks, buses and road-rail (vehicle equipped for both road and rail use), all used to support the teams maintaining the tracks and rolling stock of QR.) Where QR has a separate unit, the Fleet Services, inside the Shared Service Group, responsible for acquiring, maintaining and lending the service assets, ARG has all these services outsourced. Also, ARG has a 50% lower service vehicle cost in comparison with QR (Deloitte 2007). The notable difference in vehicle costs resulted in the internal question for QR why they are not obtaining this efficiency within the Shared Service Group. Therefore Queensland Rail is interested in investigating the causes of inefficiencies, as well as how the application of governance principles and structures can increase asset management performance.

As mentioned in the methodology section, phase one of the project focuses on investigating the organisation's current asset management practices, governance structures, innovation temperature level, and best practice for a "tailor made" asset governance application. At this stage the pilot study is in progress, where document analysis and semi-structured interviews stages have been executed. The information gathered from both of these methodologies are analysed with the help of NViVo, where information are coded and analysed in a systematic manner to find underlying patterns in regards to asset management practices.

From the preliminary analysis of documents and semi structured interviews from the pilot study (Queensland Rail) it is concluded that there are two main concentration areas that needs to be addressed. Below is a detailed list of attention areas found within the four main categories.

Asset Management Practices:

1. There is an important challenge in the asset management process, where employees have a limited perception of the asset life-cycle process. Employees possess concentrated knowledge on their responsibilities in regards to the asset; however only possess a vague idea of processes relating to the asset before and after their responsibility.
2. Based on the above point it is concluded that employees are under the belief that a master plan on asset management process exists however employees are only able to provide vague explanations/references of the "master plan".
3. There is a significant time delay in the asset acquirement process. A significant time lag exists in between when the need for a new asset is identified and the approval for acquiring the needed asset, causing inefficiencies.

4. There is a lack of standard contracting procedures between fleet services and business groups. A contractual arrangement between fleet services and business groups do exist, however each contract differs in its terms and conditions, resulting in a non-standardised procedure of asset acquirement, maintenance, and disposal. This suggests blurred accountability issues as different contractual arrangements between fleet services and business groups cause inconsistencies in who ownership, stewardship, and maintenance of the asset.

Asset Governance

1. There is a shared understanding of what is meant by stewardship and what it entails however its application is inconsistent.
2. Based on point number one on inconsistent stewardship application it is recognised that an improved incentive and penalty system (in regards to asset usage and maintenance) will increase the level of stewardship.
3. Employees believe there is a need to match autonomy in decision making, authority within the organisational structure, and accountability measures.
4. Queensland Rail governance framework was recently reviewed, resulting in the introduction of GMF001 (Governance Management Framework 001). This framework is introduced to simplify rules and regulations concerning the management of assets within Queensland Rail, shifting decision making and policy development at the asset user level. This show a change from the previous governance framework whereby asset policy development was decided at corporate core level and disseminated to asset user level. The introduction of this framework can also be seen as a response to employees' resistance to previous governance framework, where previously employees believe there was a case of "over governance" or "too many rigid rules" regarding asset management policies.
5. As mentioned in point number 4 in the "asset management practices" section, accountability issues exist as a result of the inconsistent asset contractual arrangements between fleet services and business groups.
6. There is a localised understanding of the term "governance" between each division as opposed to a convergent understanding of "governance".
    a. Rollingstock engineering: The term "governance" is understood as compliance of health and safety regulations and technical asset specifications
    b. Business groups: The term "governance" is understood as high level autonomy and authority in decision making according to business group requirement.
    c. Fleet services: The term "governance" is understood as control in asset management operational processes, where fleet services have autonomy in acquisition, maintenance, disposal, and contractual arrangements of an asset.

Conclusion and Further Research

This paper has discussed the importance of innovative asset management practices in order to increase asset performance and improve organisational performance. Through a compare and contrast of asset management and asset governance literature several contrasting and overlapping issues are identified. A pilot case study of Queensland Rail shows challenges in the application of both concepts, where challenges in asset management process and variance in governance understanding are identified as the main issues in efficient asset management practices.

The methodology of this investigation is divided into two phases. Phase one of the investigation is a case study method which involves document analysis, semi-structured interviews, and quantitative analysis of operational and financial metrics. At present this investigation is in pilot case study stage, involving Queensland Rail, where document analysis and semi-structured interviews have been executed. This has resulted in preliminary findings however there is still a need to perform quantitative analysis on relevant operational and financial matrices in order to add rigour to preliminary findings. Therefore in order to complete phase one quantitative data is to be obtained, which will be utilised to investigate correlations in regards to performance and financial measures.

Phase two of this investigation is a comparative case study method, which involve replications of methodology from phase one to a minimum of 4-6 different asset-intensive organisations. A comparative case study method is considered crucial as a compare and contrast exercise, as well as to test innovative asset management frameworks developed as a result of phase one of the methodology. Thus once phase one (or the pilot study) is completed the next step would be to perform a comparative case study in order to increase the generalisability of findings.

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