Barriers to the Effective Deployment of Information Assets: An Executive Management Perspective

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Abstract

In the knowledge-based economy the wealth-creating capacity of organisations is no longer based on tangible assets such as buildings, equipment, and vehicles alone. Intangible assets are key contributors to securing sustainable competitive advantage. It is therefore critically important that intangible *Information Assets* (IA) such as data, documents, content on web sites, and knowledge are understood and well managed. The sound management of these assets allows an organisation to run faster and better, resulting in products and services that are of a higher quality at a lower cost with the benefits of reduced risk, improved competitive position, and higher return on investment. The initial stage of this research found that executive level managers acknowledge the existence and importance of Information Assets in their organisations, but that hardly any mechanisms are in place for the management and governance of these valuable assets. This paper discusses the reasons for this situation by referring to barriers such as lack of awareness and justification, ineffective management, leadership, and governance, as well as inadequate systems and practices. Without understanding these barriers, it is impossible to improve the management of these crucial assets and thus reduce risk, improve competitive position, and increase return on investment.

Keywords: information assets, information asset management, leadership, management, governance, barriers.

Introduction

The Resource Based View (RBV) of the firm (Barney, 1991, 2001) argues that organisations possess resources such as land, labour, capital, and Information Assets that enable them to achieve competitive advantage and superior long-term performance. The Industrial Age was characterised by large manufacturing facilities and during this time management attention was focused on managing, measuring, and reporting on tangible resources and assets like buildings, plant, equipment, and machinery. In the modern knowledge-based economy the wealth-creating capacity of organisations is no longer based on tangi-

ble assets alone. Intangible assets such as data, documents, content, and knowledge are critical to the operation of every organisation (Freeze & Khulkani, 2007; Jhunjhunwala, 2009; Salamuddin, Bakar, Ibrahim, & Hassan, 2010; Wilson & Stenson, 2008). These intangible assets are referred to as *Information Assets* in this paper. Information Assets drive, record, and enforce organisational strategy and growth and enhance efficiency of resource allocation. They also help leaders to make informed decisions to improve customer acquisition/retention, employee recruitment/retention, and enhance employee motivation and loyalty (Steenkamp & Kashyap, 2010). Organisational knowledge is regarded as a key factor in management practices (Garcia-Parra, Simo, Sallan, & Mundet, 2009) and the capacity to create, transfer, and employ knowledge contributes to organisational success and sustainable competitive advantage (Davenport & Prusak, 1998; Drucker, 1994; Nonaka & Takeuchi, 1995; Spender, 1994; Teece, 1998).

Practitioner experience and anecdotal evidence in the form of numerous failed Information Technology (IT) initiatives, ineffective business practices, and a lack of understanding of the value and deployment of information on all levels of organisations generated a lack of confidence that Information Assets are being effectively managed (Experience Matters, 2012). Furthermore, whilst there is copious academic and industry material on various aspects of Information Management including Data Quality, Knowledge Management (KM), and the Semantic Web, very little research has been done on why Information Assets are not better managed in real-world organisations. In response to the observed gap in research and practices the authors embarked upon a research project to investigate the causes of this observation. The first phase of the research was conducted in Australia and South Africa and explored the deployment of data, documents, content, and knowledge from a practice perspective (Evans, Hunter, & Price, 2011; Hunter, Evans, & Price, 2011), to determine whether organisations recognise Information Assets that are of value to their operations and how these assets are managed. Preliminary findings indicate that every organisation has Information Assets that are of value to its operations. Participant 2 (P2) commented that all they have in their business is knowledge and that "the business would grind to a halt without these assets" (P6). Despite this, few organisations manage these assets with the same rigour as they manage their other scarce and valuable resources, and not one of these organisations could claim exemplary practice in the management and deployment of those assets. Where Information Asset Management (IAM) programmes do exist they seem to be compliance driven. There is a lack of a value driven response to the types of Information Assets investigated in this project.

The findings of the first phase of the research were sufficiently compelling to justify further investigation. The next phase focused on the reasons why Information Assets are not effectively deployed in organisations (i.e., the 'barriers'). This phase of the research is reported in this paper. The format for the remainder of this manuscript is as follows. In the next section literature which relates to the deployment of Information Assets is discussed. Then the presentation of the research approach and methods provides a context for the project. The identified barriers are then discussed, followed by conclusions and suggestions what future investigation might entail.

Terms and Definitions

Information Assets

Various terms and definitions can be employed to describe *Information Assets*. These assets are intangible and for the purpose of this project the following are included in the definition of Information Assets: all explicit, codified data, documents and published content, irrespective of medium (e.g., hard copy, soft copy, microfiche, and head-space) and format (e.g., Word document, spreadsheet, email, drawing, and HTML), as well as tacit knowledge. These intangible assets are inputs to the business. Intangible assets such as relationship capital, brand awareness,

and goodwill that are typically outputs of the business are excluded. Tangible assets such as Financial Assets (money), Physical Assets (buildings, plant and equipment, computer hardware and software) and Human Assets (people) are also excluded from this definition.

Governance and Management

There is a clear distinction between governance and management. *Governance* refers to what decisions must be made to ensure effective management (decision domains) and who makes the decisions (locus of accountability for decision-making). *Management* involves making and implementing the decisions (Khatri & Brown, 2010). A critical role of governance is to monitor and control the behaviour of management, who preside over the day-to-day activities of running the organisation (Fama & Jensen, 1983). Key assets such as human assets, financial assets, physical assets, Information Technology assets, relationship assets, and intangible assets such as data, information, and knowledge need to be governed (Khatri & Brown, 2010). Companies have demonstrated governance and management proficiency in human assets, financial assets, physical assets, Information Technology assets, and relationship assets. However, many organisations lack an all-encompassing information management and information governance policy (Kooper, Maes, & Lindgren, 2011). A common and scientific approach is required.

Cost, Value and Benefit

Managing Information Assets generates costs, value, and benefits. For the purpose of this research the following working definitions apply:

The ***cost*** of managing Information Assets is incurred through the creation and deployment of an organisation's data, documents, content, and knowledge. Information Assets are managed by every person in the organisation, and this is done through, amongst many things, reporting, writing and reviewing, researching, and having meetings. Most organisations consider only IT costs which are comprised of hardware + software + maintenance + support + upgrades + telecommunications + IT staff salaries. This calculation grossly underestimates the true cost because it only considers the cost of managing the organisation's infrastructure, not the cost of managing its data, information, and knowledge.

The ***value*** of an organisation's Information Assets is described as its worth to stakeholders (customers, employees, trading partners, and community) and their organisation. This value is ephemeral. Information that has value to an individual one day may not be of value to them the next day; the information ages and may become obsolete. The value is also contextual and user-specific. Consolidated information that is valuable to a Chief Executive may not be of the same value to other employees.

The ***benefit*** of managing Information Assets is the advantage that accrues from their deployment. It is measured in many ways including value-creation, reduced costs, mitigated risks, improved productivity, competitive advantage, and increased staff morale. Whether those benefits are realised and, more importantly, recognised is dependent on the culture and practices of each organisation.

Literature Review: Information Asset Management (IAM)

Information Assets

Various literature sources refer to non-tangible assets as *intangibles, information assets*, *knowledge assets*, *intangible capital* (Fincham & Roslender, 2003b; Lev, 2001; Tomer, 2008), *intellectual capital*, *intellectual assets* (Bismuth & Tojo, 2008; Litschka, Markom, & Schunder, 2006; D. A. Robertson & Lanfranconi, 2001), *intangible resources* (Bontis, Dragonetty, Jacobsen, & Roos,

1999), and *knowledge resources* (Grover & Davenport, 2001). Steenkamp and Kashyap (2010) describe Intangible Assets as assets that contribute to the organisational strategy, but are not recognised and disclosed in the balance sheet. Knowledge Assets are described as "the only meaningful resource" (Drucker, 1993), the "indisputable value drivers to success" (Jhunjhunwala, 2009), the "most important production factor" (Steenkamp & Kashyap, 2010) and according to Bontis et al. (1999) they are "today's driver of company life". Chen and Lin (2004) emphasise that the value created by intangible assets (such as human capital) prevails over that created by tangible assets (such as machines). Savage (1990) agrees that the wealth-creating capacity of the company is based on the knowledge and capabilities of its people. Rodgers and Housel (2009) suggest that modern day organisations need to more actively identify and measure these key resources and drivers of value in the organisation. The ability to create value from Information Assets depends on the management capabilities of individual firms and the implementation of appropriate business strategies. It is, therefore, critically important that these assets are well understood and properly managed and that they play a major role in the strategic management process (Swartz, 2007).

The Management of Data, Information and Knowledge

As long ago as 1989, Chambers said that "command of information decides who survives and who wins in the corporate jungle". He added that the management of information gives an enterprise a competitive edge and "information mismanagement always leads to decline" (Chambers, 1989). As with other core assets, namely financial, human, and physical, organisations should develop a formal function to manage and govern data, information, and knowledge as corporate assets. Information Management is defined as "a process of establishing the organisational principles for various data life cycles across both structured and unstructured data sources, instituting a committee to govern the principles, and setting up the processes and procedures to harness the data such that meaningful business insights are derived and delivered to the consumers at the right time in the right format" (Bhatt & Thirunavukkarasu, 2010).

Improving Information Asset Management practices should be a key focus for many organisations today, across both the public and private sectors. Everyone in an organisation, especially executives, should therefore understand the importance of effective Information Asset Management to their organisation. Without that understanding, there is little chance of the strategies being implemented successfully (Swartz, 2007). This is being driven by a range of factors, including a need to improve the efficiency of business processes, the demands of compliance regulations, and the desire to deliver new services (J. Robertson, 2005). However, Swartz (2007) refers to a Virginia Commonwealth University (VCU) study that was published in 2007 – the first comprehensive look at how Information Asset Management is practiced worldwide. The study revealed that most organisations still do not manage data and information well. Despite the recognition that data, information, and knowledge are the lifeblood of a business, organisations face significant data management challenges. The study showed that fewer than 10 percent of the organisations studied were using documented processes to manage these assets. Organisations don't seem to fully appreciate the value of their Information Assets. This was supported by the findings in this research project. Organisations often treat data, information, and knowledge as maintenance cost, whereas Swartz (2007) suggests that organisations should regard them as their greatest assets and invest in their management accordingly.

Barriers to IAM

The revolution in Information Technology over the last 25 to 30 years has been unprecedented and it has completely changed the way people live and work. Debra Logan (2010), Research VP at Gartner Inc., states that organisations have had some spectacular failures in managing informa-

tion. According to her, information management failures are social, rather than technological in nature, which makes the governance of Information Assets difficult. Evgeniou and Cartwright (2005) identified three categories of barriers to the effective deployment of Information Assets, namely, behavioural, process, and organisational barriers. Hong, Suh, & Koo (2011) also refer to the key challenge of encouraging knowledge sharing, as knowledge is becoming increasingly important for gaining competitive advantage. These authors identified two types of knowledge sharing issues, namely, individual and organisational bottlenecks. Individual barriers include internal resistance, trust, motivation, and a gap in awareness and knowledge. Organisational barriers include language issues, conflict avoidance, bureaucracy, and distance. Other barriers to knowledge transfer and sharing were identified as scarcity of time, lack of awareness about Knowledge Management (KM) and its benefits, lack of top management support, lack of funding, an unclear strategy, weak IT support, unclear information demand culture, unbalanced effort versus reward, technology and knowledge complexity, lack of trust, ineffective communication, and inadequate information systems (Hase, Sankaran, & Davies, 2006; Khakpour, Ghahremani, & Pardakhtchi, 2012; Zyngier, 2002).

Research Methodology

The practical relevance of contemporary research is a recurring theme in the fields of information systems and management (the "rigor versus relevance" debate). The practical value of much of the published research is questioned and it is argued that research often draws on methods that are inappropriate to the applied nature of these disciplines (Benbasat & Zmud, 1999; Klein & Rowe, 2008; Mohrman, Gibson, & Mohrman, 2001; Moisander & Stenfors, 2009; Nicolai & Seidl, 2010; Straub & Ang, 2011). Information Assets such as knowledge exist within the fields of practice and Schatzki, Knorr-Cetina, & Savigny (2001), Putnam (1995) and Rorty (1998) suggest that the practitioner should be at the centre of theory development. The starting point of research could, therefore, be the opinions and experiences of professionals, managers, executives, and consultants (Lee, 2010, p. 346). With this in mind the guiding principle of the research project described in this paper is a judicious combination of academic rigour, uniqueness, and practical relevance. Academic rigour gives credibility to the study. Uniqueness ensures innovative, creative, and groundbreaking work. Relevance means that real life business problems are being solved in a pragmatic fashion, which demands practical application of ideas or concepts with identifiable consequences (Goldkuhl, 2006). The research question was, "*What are the barriers to effective Information Asset Management in organisations?"*

The research method was based upon the qualitative Narrative Inquiry technique, in which research participants' recollections and interpretations of personal experiences were documented by means of one hour interviews (Bruner, 1990; Czarniawska-Joerges, 1995; Scholes, 1981, p. 205; Swap, Leonard, Schields, & Abrams, 2001; Tulving, 1972). The narratives or stories proffered by interviewees invariably reflected experiences gained from addressing real business problems, ranging from demonstrable success to manifest failure. Particular attention was paid to the consideration of confidentiality of sensitive corporate information. Consent was sought, confidentiality agreements were signed, security provisions were undertaken, and names of individuals and organisations remain unidentified. The participants included Board members and C-level executives, such as Chief Executive Officers (CEO), Chief Financial Officers (CFO), Chief Information Officers (CIO) and Chief Knowledge Officers (CKO) of predominantly large Australian and South African organisations in both private and public sectors (refer to Table 1).

Table 1: Research Participants		
PARTICIPANT NUMBER	**TITLE**	**INDUSTRY**
P1	CKO	Utilities (Pipelines)
P2	Managing Partner	Services (Legal)
P3	CKO	Government (State)
P4	CFO	Utilities (Rail)
P5	Data Management	Banking, Finance and Insurance
P6	CEO	Services (HR)
P7	CFO	Banking, Finance and Insurance
P8	CFO	Services (Automotive)
P9	CEO	Manufacturing (Process)
P10	Board member	Various, mostly banking
P11	CIO	Banking, Finance and Insurance
P12	CIO	Government (Local)
P13	CEO	Services (Information)
P14	CIO	Banking, Finance and Insurance
P15	CFO	Banking, Finance and Insurance
P16	CFO	Resources (Oil and Gas)
P17	CFO	Banking, Finance and Insurance

The framework for conducting the one hour qualitative interviews was provided by the Long Interview Technique (McCracken, 1988). An interview protocol was used to facilitate gathering the narratives of research participants by focusing the discussion on the specific research question and the research participant's experience and by promoting a consistent approach across a number of interviews (Swap et al., 2001). At the start of the interview, general questions about the organisation were asked to develop trust between the researcher and participant and to provide a context for the more detailed discussion to follow. Planned prompts (predetermined) and floating prompts (an impromptu decision to explore a comment in more detail) enabled the researchers to delve into detail as required. The interviews were audio recorded for future analysis to identify emerging themes and barriers.

Analysing qualitative data involves significant effort and before the interviews it is incumbent upon the qualitative researcher to understand how the data will be analysed (Luna-Reyes & Andersen, 2003). In qualitative research it is common practice to identify emerging themes. In this project the interview transcripts were thoroughly reviewed to identify categories of data which support the identification of emerging themes and in future may be employed to construct a research framework that precisely describes all aspects of the research project, from issue to resolution. As data gathered from qualitative interviews were compared they either supported the creation of new categories or provided support for existing categories. As the process was carried out it was incumbent upon the researcher to "… be open to possibilities afforded by the text rather

than projecting a predetermined system of meanings onto the textual data" (Thompson, 1997, p. 441). Data gathering and analysis was regarded as complete when "theoretical saturation" was reached, i.e., when no new categories of data could be identified. A large number of barriers – that support the findings from the literature review – were identified in a thorough data analysis. These barriers were subsequently clustered into five different categories. These categories are discussed in the next section.

Findings and Discussion: Barriers to Effective IAM

This section describes the barriers to the effective management of Information Assets, as identified by a detailed literature review and this empirical research. A diagrammatic representation of the barriers is included at the end of this section (Figure 1).

Lack of Awareness and Understanding

The problem is not recognised

Oulton (1993) quoted Lewis and Martin who did a study of information management in government organisations, manufacturing, and services and found that, while 47 per cent of respondents said that information management was meaningful as a concept in their situation and 23 per cent saw it as a key factor in decision-making, 25 per cent did not know the state of information management in their organisation and only 38 per cent of organisations had a post designated for such a role. Many years later, Debra Logan (2010) said that organisations still fail to perceive the information problem at all. This research supports the literature and also found that organisations to this day do not realise the risk of not managing their Information Assets effectively. The managing partner of a legal firm (P2) said that he is not sure, even in his own mind, that there is a problem to solve, as a problem implies that there's downside based on the way that the organisation is working now. The failure of executive management to perceive the problem prevents high level support and funding to solve the problem. Participant (P14) commented that today's executives do not understand information management and added that it is imperative that tomorrow's leaders should.

Lack of formal education

Vickers stated back in 1993 that, while it is essential that some people should be trained specifically for the information manager role, it is also important to include at least the basic principles of information management in the training of all managers, just as they would study the principles of accountancy without becoming specialists in that subject. Martin, Davies, & Titterington (1991) also argue strongly for the explicit provision of information management courses on undergraduate and post-graduate level. Despite this, managers commented during the interviews that they never had the opportunity to do a course in information management as part of their formal education/degree programs. Even today, Information Management is not yet a recognised discipline and people often confuse it with Information Technology.

Lack of on-the-job training and induction

An effective induction process – including training in the way Information Assets are managed – is critical to an organisation. However, the researchers found that induction processes at organisations "are not done very well" and do not succeed in creating a culture of effective management of data, information and knowledge. One manager (P9) commented that "people seem to be shown to a seat with a computer and that's it".

Organisations do not understand their Information Assets

One participant (P12) mentioned the importance of organisational 'maturity' in the way they understand master data and its importance. He mentioned that data stewardship (who is responsible for the data) is becoming a topic of significance and that mature organisations truly understand and realise return on investment in information. De Long and Fahey (2000) identified the impact of culture on the management of knowledge assets. According to them cultures, and particularly subcultures, heavily influence what is perceived as useful, important, or valid information and knowledge in an organisation. Culture shapes what a group defines as relevant knowledge, and this will directly affect which knowledge a unit focuses on. Martin et al. (1991) indicate that more than simple awareness creation is required as the majority of managers have no difficulty in perceiving the advantages of Information Asset Management, but this is not sufficient to persuade them to make the necessary effort and investment to adopt the concept. They add that management need to be convinced of the benefits of effective IAM.

Justification

There is no catalyst or incentive to act

Apart from the lack of awareness, an important barrier to the management of Information Assets is a lack of justification to invest the time and effort into managing Information Assets. Ineffective and inefficient Information Asset Management does not necessarily stop a business from running, which decreases its priority and encourages complacency. One participant (P6) commented that their Information Assets are not managed well, but it is not stopping them from making money. While they're making money, "it gets pushed out there into the future – one day, one day, we'll do these things". The bad management of Information Assets rarely causes an overt problem and P2 commented that "we didn't go broke, we didn't lose much value, the crisis never occurred." A Knowledge Manager (P1) and a Board Member (P10) both commented that senior managers do not pay attention to data, information, and knowledge because everything is working fine and people can find what they need to do their jobs. The CKO added that businesses have insurance cover in case something happens, "so why worry?" Some of the participants commented that the types of businesses they run do not warrant action. For example, P2 said, "We're not running an oil rig where someone's going to get killed if we don't follow the manual". P3 agreed that effective Information Asset Management is not a priority as "it is not going to save someone's life".

In organisations where the value of Information Assets is not recognised, it often takes a crisis or severe financial loss to change the attitude. P7 confirmed that it sometimes takes a disaster "for example when you lose that key person and there are no procedures, there are no documents." The Managing Partner of a legal firm (P3) agrees that "if people don't suffer pain they will not be likely to want to do something differently". The Chief Executive Officer of a large manufacturing company (P9) mentioned that they made a large expansion of one of their plants about two years ago and that was the catalyst to try and pull together plant operating knowledge and customer knowledge. They built a business case for a $15 million investment which was approved, because "at that moment we realised how much we didn't know". This finding is supported by Logan (2010) who says that a failed audit, a lawsuit or an economic crisis often forces organisations to address the problem.

Compliance requirements are often the only driver

According to Luthy and Forcht (2006) there is a need for organisations to comply with various reporting authorities, to understand the laws and regulations as well as their impact on information management and internal control systems. The US Sarbanes-Oxley Act of 2002 is an exam-

ple of such legislation. Bhatt and Thirunavukkarasu (2010) are concerned that organisations often only pay attention to the management and governance of data, information, and knowledge if they are forced to comply with regulations and legislation. The interviewees in this research agreed: "I think it's easier to sell the information benefits on the back of compliance" (P12). People see secondary benefit in managing the information: "like it's going to keep me out of jail if I comply with the legislation". The CIO of a finance company (P11) agreed that "the day they say to the finance guys that there are new Internal Financial Revenue Services (IFRS) rules, things will change overnight as far as managing the intangible assets are concerned." The added focus on compliance has resulted in even more reluctance to manage information, and many employees save and keep all e-mails, files, data, and information to ensure that they do not get into any kind of trouble. The "wasteful expense", the "potential legal repercussions", or the time and energy someone else might have to spend making sense of it one day is often not considered (Bhatt & Thirunavukkarasu, 2010).

IAM gets lost in the day-to-day activities

The priority of managing Information Assets "tends to get pushed away" (P8) as "there are other priorities, a thousand priorities" (P3). Managers are too busy with the day to day activities such as "putting out fires, making money, making the customer happy and putting aside five minutes a week to think about what we're going to do with our systems". This is especially true for organisations that are growing rapidly as they have more important issues, such as space issues and staffing issues that " occupy more of my thinking than anything else" (P6). Employees also feel that there are burning issues they need to tend to in the first instance: "I have real work to do; I haven't got time to waste on this" (P12). External pressure such as a volatile economic climate also impacts on the Information Asset Management of businesses, as described by the CEO of a large manufacturing company: "We've just been through the GFC and sales are tough and business is tough. We've got a lot of immediate priorities to generate better cash flows and better returns to shareholder. You get locked up a bit in the here and now" (P9).

The cost of IAM is unknown

The cost of data, information, and knowledge are often not recorded. Accounting standards do not allow organisations to determine these costs, or the costs are too difficult to determine. Identified costs usually relate to amounts associated with the acquisition, operation, and maintenance of an information system. None of the research participants indicated that cost associated with the time to interact with an Information Asset system to enter required data was determined. The CFO of an automotive services company (P8) agreed that they do not cost and value their Information Assets as they should, but added that he thinks they are slowly waking up to that. "But is it getting the attention that it deserves? Yes, slowly. Is it top priority? No."

The value of IAM is unknown

Organisations don't spend enough time thinking about the value and importance of Information Assets. A CFO acknowledged that "like all organisations, we certainly struggle with it, and we don't bring it to the surface and give it the level of resources that it would need to get that value out. I think if we did understand the value then we'd change our thinking" (P8). This indicates a gap in people's understanding of what drives value. P13 agreed that managers work on the basis that these assets "will still be there tomorrow". Organisations also do not have a way to measure the value of data, information, and knowledge as it is so wide spread in email, Internet content, policies and procedures, et cetera. P7 said "it's just wholesale across the business" and also added that he does not know how people would go about capturing and valuing these assets and whether there is a reliable method to do this.

The value of data, information, and knowledge is contextual

The value of data, information, and knowledge is temporally, managerially, and professionally contextual. In terms of time, Participant 6 said that "there's something ephemeral about the assets we have, if you can call them assets. Yesterday I had an asset. Today I have none. So it's very, it's a very ephemeral asset to have" (P6). The value of data, information, and knowledge is also contextual in terms of level in the organisation (level of seniority). Participant 11 is of the opinion that information has to be interpreted at all the layers of the organisation, so it actually makes sense to some of the people at the junior levels. Finally, the value of data, information, and knowledge is contextual in terms of functional area in the business. Different groups and individuals have different views of information management. Participant 11 agreed that "the information challenges that you meet really depend on the area where you operate from".

The value of IA cannot be determined until a business is sold

A reason for the ineffective management of Information Assets is that the value of a business is only determined when the business is sold (P6). The accounting system doesn't allow a business to value information on the balance sheet. Wilson and Stenson (2008) are of the opinion that "one can argue with some conviction that what is not shown on an enterprise's balance sheet (for example morale of employees, purchase pre-disposition in the market place, managerial capability, Information Assets) is of greater importance than that which is shown". Participants indicated that goodwill is an intangible asset and "you can't put goodwill onto your balance sheet. You only put it on there when you buy somebody else's business" (P9).

The benefits of effective IAM are unknown

In his paper on Information Management, Oulton (1993) indicated that a stumbling block to the introduction of Information Management into organisations is the poor recognition of its potential benefits. According to him, as senior managers rely on tangible experience and common sense, it is difficult to persuade them of any links between formal information management skills and organisational success. It is clear that businesses focus on the tangibles. The manager of a financial institution focuses on "hard things that make the business work, such as sales, getting the products to market, collecting and investing the money and making sure it gets onto the books, as well as managing expenses" (P17). The focus of a young organisation would be on growing more rapidly and initiatives that bring more business "rather than looking for benefits of intangibles" (P14). Investors are mostly concerned with the bottom line and are, therefore, focused on revenue and costs. Managers believe that they would be able to make better decisions and, therefore, show a return on investment if they had certain pieces of information (P12). One manager (P8) commented that "everybody in business understands they don't manage their Information Assets well, but they don't know what the benefit is by actually managing them a lot better." As an example, an organisation had trouble justifying the investment in a data warehouse, as the business people could not see the benefit of using the data warehouse and commented, "We're going to spend all this money, pushing the data to the one position and one access point, but am I going to be able to run the business any better? No one could see they could run the business any better, so the data warehouse sort of fell apart." (P8)

The benefits of IAM are intangible

The difficulty with Information Assets is the finite quantification of the benefits. Measuring the benefits of Information Assets is not easy. The CKO of a utilities company said that she couldn't find any hard benefits and "for the project to get off its legs at the time, I had to show hard benefits" (P1). It is extremely hard to work at such a conceptual level because it requires "abstract or conceptual thinking" (P11). An interesting comment from the CFO of a financial institution (P7)

was that Myers Briggs research shows that a good three quarters of people are inherently sensing (S) and judgemental (J) people, who care about hard facts and concrete data and who lack flexibility. He added that "most people don't like what is nebulous, which is why they struggle with these intangibles". The CKO of a Government department (P3) has the view that organisations are not good at measuring the benefit in dollar terms, but they can understand it "in reduction of pain". Measuring the benefits of tangible assets is easier, and shareholders look at the dollar values of physical assets, physical liabilities, and the generation of wealth. A board member articulated it as follows, "You misappropriate $1 million and it comes out. You lose a truck, everyone asks 'where's the truck'? But this is nebulous" (P10).

On the other hand two organisations reported that they derived benefits from managing their Information Assets. It was interesting that the manager of a financial services company (P7) indicated that he wasn't actually interested in doing benefits analysis, as the benefits were obvious and that he does not want to "waste valuable resource time on justifying what is completely obvious anyway. Just by walking around the organisation I can see how people use the system and how they can collaborate and work more effectively. I know the benefits have been realised because people are using the system on an every minute of the day basis". In another organisation the benefits were also visible and the manager commented that the success has been exponential. "Success breeds success. As soon as people started gaining value out of the Information Assets, they are very quick to find other opportunities within their immediate business environment, and then it starts snowballing" (P12).

Benefits of IAM are inter-twined

Information and knowledge only assume value when they affect decision making and are translated into action to become a benefit to the organisation (De Long & Fahey, 2000). It is hard to prove that you are managing information better than everybody else and put a value on that. Potential purchasers would want to do due diligence and expect the firm to show how they manage information better than anybody else (P9). If a business misses out on a job they can see that clearly, but they cannot see the opportunity to make more profit on a job they did get. It is very hard to measure and one would have to get inside the job and look at how people were working. "Unless you are intimately involved you can't just pick up a piece of paper and tell that it was clearly done inefficiently" (P2).

Benefits of IAM are difficult to crystallise

Managers often believe that there is significant value in information, but one participant asked, "How do you wrap your arms around it and how do you give it value?" (P8). The problem goes back to CFOs who want to know how much it is costing them behind the scenes, but also how much more value they get out of the business by using Information Assets better. The cost and return on investment of an information and knowledge management programme therefore have to be justified to the organisational board. Management teams usually want to know what the return in hard cash will be on what they will be spending. This is often impossible, as knowledge is an intangible asset. Du Plessis (2008) indicates that none of the available models and measures of hard return on investment has yet been accepted as a standard model in the world of information and knowledge management. The return on investment will thus be defined in qualitative and quantitative measures, which may be regarded as a barrier. Organisations that were interviewed also do not determine the cost or benefits of managing Information Assets, although one Chief Financial Officer (P8) indicated that they are "slowly waking up to that". Despite this it is still not getting the attention it deserves and it is certainly not top priority".

Process view

Data, information, and knowledge contribute value to the business to the extent that they are often the triggers of business processes. It is difficult to value the information itself – maybe it is the value of the transaction that it triggers. The CIO of a finance firm (P14) commented that he has difficulty trying to understand how he would value a piece of information coming in, in isolation of the whole business process. The CIO of a government organisation indicated that they are beginning to understand process and to see the value of process. "Rather than saying we're going to drive it from an information perspective towards the process, we are driving from the process and information is popping out" (P12).

In certain service industries it pays to be inefficient

The drive for efficiency in certain industries is profit margin and the pricing model does not force them to minimise the time they spend doing a job. A participant from a law firm (P2) said that until lawyers are forced to operate efficiently, they are actually rewarded for being disorganised. "If I'm a lawyer, if it takes all day, that's all right. In fact, the longer it takes the better. There's not a huge incentive to get super organised across the firm". Effective information management is also not critical in the consulting business, because they charge on a time materials type basis: "So we're not always looking for the shortest route home" (P6).

IAM is not an interesting area

The management of information is not an interesting topic. Participant 3 said, "It's a pretty dry topic. I don't think most people really want to think about it, because it's pretty difficult. It's not as tangible as hard assets like money." The CIO of a local government organisation (P12) agreed that "people do not read the information policy first thing in the morning. You don't see people thinking that it is a beautiful piece of information. It's a hard sell."

People have their own agendas

According to Martin et al. (1991) one of the most important barriers to the implementation of information management is the adoption of a proprietary attitude to information on the part of certain individuals and departments. People look at information as power and they are therefore reluctant to share it with others. Self-interest (what's in it for me?) was also identified by the interview participants as a barrier. People have their own agendas and most people in organisations are only focused on survival. As a result they do not drive the business and make the best decisions for the business. "It's all about their own agenda" (P13).

Risk management is seen as a burden

As information is seen as a corporate asset, there are opportunities in managing it well and risks in managing it poorly. Organisations therefore need to understand where their risks lie and focus on managing their assets. This requires organisations to understand where their Information Assets are held, just as they need to understand where their money is. The important issues will be governance and clear accountabilities; cultural issues and staff training; capability of supporting professionals; clarity and appropriateness of processes and procedures and supporting technical infrastructure (Ceeney, 2009). The effective management of Information Assets therefore requires appropriate enabling systems and practices. Ceeney (2009, p. 340) comments that organisations understand financial issues and know how to respond "but our understanding of information issues is weaker, and so are our responses. We seem scarily content with the technical solution, and risk missing the fundamentals."

The CKO of a utilities company (P1) agreed that it is sometimes necessary to "go down the risk route and start scaring them." Maybe the crisis hasn't happened, but here are some examples where it's happened with other organisations and it has cost them dearly. She added that in their organisation there are some risks that "if we don't fix them can potentially become costly." The only way in which she was able to convince the organisation that they needed to focus on their records and information was to "go straight to the business risk guy and ask whether he realises the risks that the organisation faces, based on the fact that we're not managing our records and our information properly." That was the turning point, as he understood the risks.

Whilst the management of risk is clearly a business driver, it also requires effort and enterprises often see it as an administrative burden. Senior managers, who should be leading their organisations on a strategic level, often find that their days are being consumed with compliance activities. "You can see how frustrated he is and he has actually become quite aggressive about it" (P12).

Governance

Lack of accountability

A lack of governance was identified as an important reason why organisations are not successful in managing their Information Assets. Logan (2010) argues that the root of the problem with the management of information is this lack of accountability, as the structure of an organisation often does not include a role of Data-, Information- or Knowledge Manager. Clearly articulating the accountability at all levels of the organisation will support the appropriate management of Information Assets. The participant from a large bank indicated that there are varying opinions about who is responsible and added "who is responsible hasn't been nutted out of this organisation" (P5).

Although some managers realise the need for such a role in the company, it has often not materialised yet. The CEO of a large manufacturing company commented that they haven't appointed somebody in a Chief Information- or Chief Knowledge Officer position because of cost. He acknowledged, "It's a pretty rudimentary view given the apparent value I place on information. It's something we should do. How do I make an excuse for not doing that - it doesn't seem sensible does it?" (P9).

Level of the responsible person

The person who is accountable for the management of Information Assets is often not at the correct level to influence the strategy of the organisation; they are rarely on executive level where their voice will be heard. According to Oulton (1993) representatives of diverse groups have all laid claim to the field of information management as their own, e.g., managers, records managers and archivists, computer science graduates, and data processing personnel, as well as librarians and information scientists. In one of the organisations that was surveyed in this project, the records manager was responsible for the management of data, information, and knowledge, but the CKO (P1) commented that he was not at the right level in the organisation to be heard; "he was making noise, but he wasn't getting anywhere." She added, "When I came on board I started regular meetings and communication. I had a group role as CKO, whereas he did not."

The role of the CIO

It is often wrongly assumed that information is synonymous with IT. J. Robertson (2005) says that, in many cases, 'information management' has meant deploying new technology solutions, such as content or document management systems, data warehousing or portal applications.

However, IAM is much more than technology. It is about the business processes and practices that underpin the creation and use of information and therefore people, process, and content must be addressed if information management projects are to succeed (Ceeney, 2009). Logan (2010) agrees that the Information Technology function owns the systems that are used to create and store Information Assets. Their job is to manage information technology: hardware, software, and networks. The business people who produce and use the information inherently know its value and understand what contribution it makes to their part of the business. However, it is often difficult to get business people to articulate their information needs. They do not wish to waste their valuable time performing Information Asset Management tasks. In Logan's words, "And so the circular argument begins: it is not my job, IT should do it, by which they mean buy more storage and get us that piece of magic software that will fix the problem once and for all" (Logan, 2010). Unfortunately IT has a poor track record of success.

In many of the organisations that were included in the study the responsibility for information and knowledge management lies with the CIO. Added to this, the majority of the participants commented that the CIO is not the right person as (s)he has a technical focus. Participant 1 commented, "The CIO wasn't interested. His focus was on the technology element. His biggest issue was speed and access, not managing the information and the content" (P1). Participant 3 agreed that their CIO thinks about information holistically and that managing information it is not his priority. One of the participating companies realised the need to bridge the gap between IT and the rest of the business and they appointed bridging people, or business analysts to play this role. "We have very technical people and the IT junkies, and we have someone that sat over the top that has some strategic vision" (P8).

The role of the board

Board members are more focused on strategy and managing risk than on Information Asset Management. The Director of a number of boards (P6) indicated that – from a Director's perspective – data, information, and knowledge are invisible unless something goes wrong: "It's not on the radar. It's not considered to be a big enough risk. It's just not on the agenda." He added that it is difficult to educate boards, and unless the management team elevated the management of information to the board level, it will probably not be done. According to Ceeney (2009) information management is going to be a major issue on Board agendas for years to come, as they have a responsibility to manage their information as effectively as they do other assets. Boards need to move away from the notion that IT will solve their problems. The real challenge is for Boards to add Information Asset Management to their agenda and treat it the same way as they treat HR or Finance. "We need to demystify Information Management and make it mainstream. And we need to do it now" (Ceeney, 2009, p. 339).

Leadership and Management

Executive support is absent

The support of senior managers is crucial to create a culture of valuing and sharing Information Assets. The Chief Executive Officer (CEO) is often the only one who takes an enterprise view of the company, who cares about the overall performance, and who is concerned with creating sustainable value. CEOs should think about data, information, and knowledge on a firm-wide basis and these assets should be very important to them. Change needs a change champion, somebody that's strong enough to pull an organisation through the low parts of the change cycle. That person needs to be a visionary. It has to be an executive (P12).

Although executive support is crucial for putting effective governance and management of Information Assets in place, it is often absent. The participant from a large bank experiences a lack of

support from the top. “A challenge we have at the moment is trying to make sure that at the top they’re actually putting the money where their mouth is. It’s not because they don’t want to or that they don’t believe it, there are so many competing priorities” (P5). On the question of how their Executive views the value of information and knowledge and how it should be managed, participant 14 responded, “Real laissez-faire, I don't think it's something that gets discussed.” The CKO of a government department (P3) agreed that executives sometimes understand that information and knowledge is valued for purposes of improving efficiency and effectiveness of the organisation but added, “Would they jump on a sword for that? No.”

On the other hand, the CEO of the financial services firm that implemented a strategy to manage their Information Assets effectively has seen the benefits immediately, especially the ability to store and retrieve emails (P7). Another participant (P3) also indicated that their CEO is supportive of the notion that knowledge is shared, as this would mean that customers will benefit.

Mistakes are not tolerated

Organisations should have a culture that learning and mistakes are good, because that's how people learn. “If there is a culture of prosecution – if I'm wrong I'm going to be off with my head – data, information, and knowledge will not be managed” (P12).

Managers create workarounds

According to Best (2010), the corporate information manager has to consider the extent to which organisational structure matches the mission of the organisation as well as the pattern of information processing in the company. An important aspect of Information Management is the extent to which information is processed and distributed in the location where it will be most used, and the frequency and complexity where information is shared between functions and/or processing systems. In reality it was found that managers get by on experience, which is why they don’t focus on managing the Information Assets. P11 commented, “A blessing and a curse is that many of the top management came through the ranks, so they know where the curve balls are, they know where the efficiencies are, and they've learned to make do with those defects. That's how we got so well through the crisis. As far as they're concerned, expert judgment or gut feel still goes a long way to make this good.”

There are no rewards and recognition for managing information assets

Unless there is accountability for the management of information, organisations will get sub optimal results. Participant 13 commented that people will manage their budget because they get incentives according to the budget, so they drive it from that perspective. A Knowledge Manager (P1) indicated that, instead of quantifying it from a hard benefit, she prefers to show and communicate back the success stories. “That’s how I try to prove value to the organisation. So every time I hear that somebody saved some time by accessing a document that they didn’t have to redo themselves, or finding a specialist really quickly on the intranet, or using one of our external research tools to learn more about a client, I capture and communicate it back to the business.”

The organisation lacks Information Asset Management vision

What is limiting organisations seems to be the lack of vision and clarity about what they actually need to try and become a better organisation. “The vision and insight does not exist. Organisations do not understand that if they invest 80 per cent more effort in Information Asset Management they will see a return on their investment. “You get to your five year term of office and you say, so what did we do the last five years? We were extremely busy but what did we actually do? We did mostly maintenance” (P12).

Managers focus on information technology, not information management

Organisations often spend too much on IT infrastructure and software and very little on data management and quality. Managers often regard IT infrastructure problems as more critical than information availability. A Knowledge Manager (P1) supported this by indicating that "the MD just assumed that the work we wanted to do was a technical solution, so I've been very careful in all the change communications to show that it's not." Best (2010) agrees that it is information which must be managed, rather than the technology. Processes must be in place to ensure the data is clean and that nothing is entered that may contaminate the data. Processes should exist to document tacit knowledge and ensure the data obtained will support decision making and contribute to competitive advantage.

Lack of discipline in managing information as an enterprise asset

The data, documents, content, and knowledge of an organisation is an enterprise asset but it is often not managed as such. Internal information is often managed in silos. In a large manufacturing firm (P9) the manufacturing general manager owns his internal valuable information while the CFO of an automotive services company (P8) commented that they are a classic siloed organisation with limited sharing of information between departments. This situation is currently changing: "We're now recognising that we need to do that now in a better way, and we are creating our library and bringing the business together and sharing information a lot more than what we ever did."

Data, information, and knowledge are stored everywhere on people's hard drives and in legacy systems. Some of the information is stored on old servers that have been archived and some is kept in various places on various servers in the company. It is stored electronically, in hard copy, in different physical places and accessed by different computers on the site. The information is not coordinated and collated or centralised at all, both with regard to historical data and current data. According to the CKO of a government department it is also a massive challenge for their organisation, "because we've got buckets of information everywhere. We've got Access databases all over the place; we've got people with 20 years' worth of work stuck in an email box or on a disk, with masses of information in their personal drives, just because they've never been told not to put their information there." The information is completely isolated from anyone. "It can't be shared, it can't be found. If they leave all the work they've done is sitting on a P drive somewhere". (P3)

As the organisational culture embodies all the unspoken norms, or rules, also regarding the distribution of knowledge, the culture actually dictates what knowledge belongs to the organisation and what knowledge remains in control of individuals or sub-units. It is a natural inclination for people not to collaborate or share, and integrating knowledge into the firm and getting people to contribute and share knowledge is a real challenge. De Long and Fahey (2000, p. 118) argue that knowledge sharing is "often compromised, if not completely sacrificed, at the altar of norms and practices that advocate and reinforce the supremacy of individual knowledge." Participant 2 agreed during the interview: "They are managing it between themselves, but no one else can get to it."

Resistance to change

People resist change. A Knowledge Manager (P3) commented that it is not part of people's mindset to think about how information could be used elsewhere by others. "That's the culture shift ... which is a massive barrier. I think that's almost a generational change." The managing partner of a legal firm (P2) experienced tremendous resistance when he tried to move the company to e-

files. He added, “It was extraordinary as we're only talking about three years ago, not ten years ago. There was an incredible amount of glue between the lawyers and their hard copy files.” Participant 12 mentioned that, if managers say that they are going to put data, information, and knowledge management in place, different parts of the organisation react differently: “The operational staff said we're already so under pressure, demand exceeds our capacity tenfold, now you just want to create another stick to hit us over the head with. The guys in the middle said that if you create more work, it will create additional activity that will assume effort and they'd rather use that effort to do real work. The guys at the more senior management, upper management, sat there very quietly. They were looking at this with a lot of suspicion and thinking they should make sure this thing dies quickly. We'll find a way of throttling it.”

Enabling Systems and Practices

Business language is imprecise

An important challenge of managing data, information, and knowledge in organisations is that there is no standard language and glossary of terms. Outside of the organisation, but even within the organisation, it is a challenge to get everybody to speak the same language in terms of data governance and data management technique (P5).

Accounting practices do not account for data, information and knowledge

Traditional accounting ratios have not been able to measure intangible assets. Participants agreed that data, information, and knowledge are of value to the company, but indicated that, under the accounting rules and various other traditional practices, they are not formally accounted for and reported on the balance sheet unless it is a really substantial activity. No participants indicated that any of the tools for measuring intellectual capital that are mentioned in literature (Nafukho, 2009), namely knowledge ratio, return on knowledge assets, or training expenses per employee, are used in their organisations. A possible explanation why organisations do not use knowledge ratios is that anything that is considered an asset has to be reflected by the organisations’ end-of-year financial statements. Organisations with more knowledge workers would therefore have to pay more tax on their knowledge assets (Nafukho, 2009). The problem is that “if the accounting systems don’t create the ability to value information, then businesses won’t either” (P9).

Technology shortcomings

IT departments are notorious for making promises they cannot keep. One manager commented that “they're like the car salesman who's basically saying, you'll never have a problem. Well, it's just nonsense, eventually you will” (P8). A Knowledge Manager commented on the restrictions of technology in their firm. Their biggest challenge is the size of their documents. “A lot of our design intelligence is image based. We can have files that could be as large as a hundred megabytes” (P1). The manager of an HR recruitment company (P6) said that they have a database system that does not really work, as well as inadequate software: “It's clunky, it's slow, it's excessively manual in its data input and so forth. We can visualise a system that would be better but we don't know quite where to find it. It's hard to buy stuff that you don't know much about because you're worried that you're going to make a mistake. Business owners are worried about spending a lot of money on something that might actually be worse than what they've got because you hear stories of people doing just that.” Rego, Pinho, Pedrosa, & Pina (2009) comment that some technologies are not barriers per se, but become so because individuals have unrealistic expectations about them.

In summary, the barriers to the effective management of Information Assets, as identified by the literature review and empirical research is shown in Figure 1.

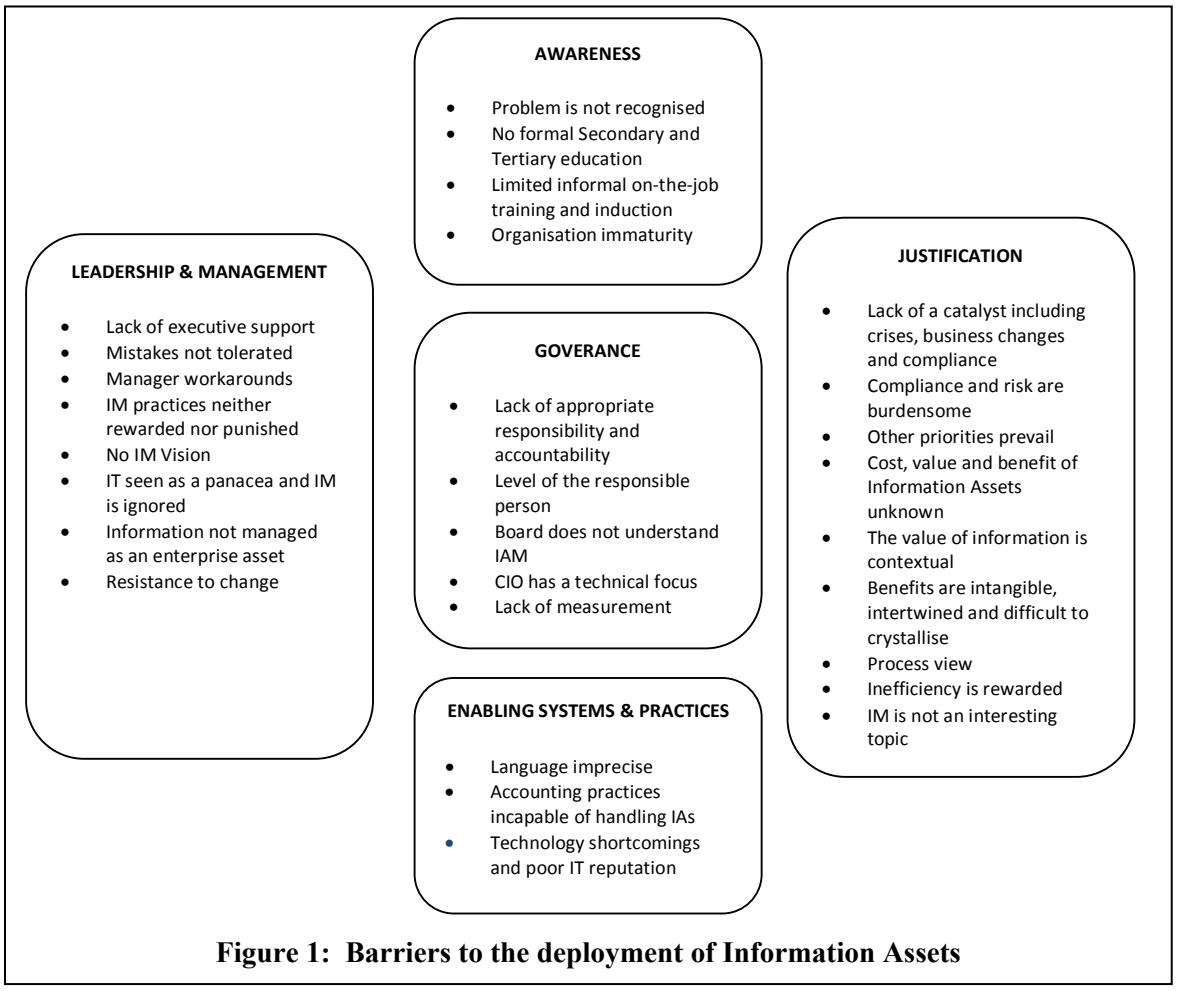

Figure 1: Barriers to the deployment of Information Assets

Summary and Conclusions

One of the important responsibilities of Managing Directors, Chief Executive Officers, and Managing Partners is to effectively deploy the assets and resources of their organisations. The assets they deploy are Physical Assets, comprised of plant and equipment, buildings, office furniture, and computer hardware and software; Human Assets, their people; Financial Assets, their working capital and annual budget; and Information Assets which constitute the rest of the organisation and include data, documents, content, and knowledge. Information Assets are becoming crucial for organisations' competitiveness and growth. Companies need to be able to earn economic returns from Information Assets (Bismuth & Tojo, 2008) and their effective management should be a topic of vital interest to the senior leadership of most organisations. Boards and senior management are well-versed in taking good care of their physical, financial, and human assets, but evidence is mounting that Information Assets are being neglected.

Physical, Human, and Financial Assets are effectively deployed through application of appropriate governance and management, structure, and tools. Organisations typically have a Chief Financial Officer, financial experts, and managers with delegated authority who use the framework of a Chart of Accounts to allocate expenditure and use tools including a Balance Sheet and In-

come Statement with which they manage and report on the deployment of their Financial Assets. Similarly, organisations often have a Director of HR and officers with line management responsibility, the framework of an organisation chart, and tools including roles and responsibilities statements and Key Performance Indicators by which they manage the deployment of those Human Resources. People responsible for Physical Assets include Plant Managers, Directors of Corporate Services or Property and IT Managers who use the frameworks of Asset Registers and IT Architectures, and tools including depreciation schedules and capital works and maintenance programmes. The findings of this research supported the literature that hardly any mechanisms are in place for the management of Information Assets. There are rarely governance structures in place with a single Chief Information Officer who is not only responsible but accountable for how that information is managed.

As money and information are both acknowledged as vital corporate assets, it is important to know why information is managed differently at enterprise level. Many organisations do not have a precise and accurate description down to the level of discrete and unique activity of exactly what they do. Furthermore, they do not know what data, documents, content, and knowledge are deployed in the conduct of those activities. In many organisations each individual manages his or her own information and few people know where critical information resides, who has access to it, and how long they keep it. There is usually no Information Chart of Accounts to ensure that enterprise information is managed with the same rigour as its money. It is therefore difficult to develop a framework by which Information Assets can be allocated and managed in the same manner as other vital assets are managed via a Chart of Accounts or Organisation Chart.

Whilst they recognise that data, information, and knowledge are vital to their operation, organisations do not know how to identify, cost, value, manage, and realise the benefits of their Information Assets. Many organisations regard the cost of managing information and knowledge as equivalent to the combined cost of hardware, software, maintenance, support, upgrades, telecommunications, and IT staff salaries, i.e., the cost of procuring and managing the infrastructure, but they don't take into account the time that is spent managing information. Organisations don't apply either an absolute or relative value to their Information Assets and certainly don't account for them on the Balance Sheet unless at time of sale of the organisation. Few organisations implement a formal benefits realisation programme to measure the return on investment of their Information Asset Management initiatives.

The qualitative research reported here represents an investigation into the barriers to the management of Information Assets. A limitation of this type of investigation is the small number of research participants. However, interviews were conducted until theoretical saturation was attained and no new themes emerged from the interviews.

Future research should address the shortcoming articulated above and subsequent investigations could also delve further into reasons for the lack of progress in managing Information Assets and how this situation may be addressed by deriving quantifiable benefits from IAM. Future research can also include an international perspective. A framework for effective deployment of data, information, and knowledge assets in organisations can be developed to address the barriers to the effective management of Information Assets identified in this paper.

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