

How and Why Redundant Knowledge Assets Are Identified

A Case Study of the End of the Knowledge Asset Lifecycle

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Abstract: Public sector reform, or New Public Management in Australia, and around the world, is causing operational and cultural change within government departments. For such transformation to occur, people and organisations are required to 'unlearn' the old and now 'dysfunctional' ways of doing things. The changes are analogous to the process of 'creative destruction', where organisations make their knowledge obsolete through developments in technology, business processes or business models. This phenomenon is common to all organisations, social, firms, and societies, as they all evolve through adapting the knowledge of their members. An inability to unlearn can reduce the speed with which new learning takes place, potentially favouring efficiency over flexibility, and inhibiting the ability to change. Based on research into twelve public sector organisations in Australia, the research established a nexus between the two management disciplines of strategic management and knowledge management. The focus of the research was a study of the life cycle of knowledge assets, which starts and ends when their need or otherwise is identified directly or indirectly by strategic plans. Knowledge assets are acquired, deployed, utilised and maintained until they are no longer needed. They are then disposed of by outsourcing or atrophy when people are redeployed or retrained. The research found that the majority of the public sector practitioners interviewed admitted that their departments had no formal processes for identifying redundant knowledge assets. This is supported by case studies on Australian Government departments where the focus of these programs is on knowledge capture, sharing and utilisation.

Keywords: Knowledge Management, Knowledge Asset, Knowledge Asset Life Cycle

Introduction and Background

THIS PAPER IS based on research, conducted into twelve public sector organisations in Australia, which established a nexus between the two management disciplines of strategic management and knowledge management. The focus of the research was a study of the life cycle of knowledge assets, which starts and ends when their need or otherwise is identified directly or indirectly by strategic plans.

The research utilised case study as the overall research strategy, which combined a variety of methods including interviews, questionnaires and surveys. The approach taken with data analysis was to use the coding methods often employed in grounded theory.

Why are Knowledge Assets Needed?

The answer to this question comes from the Resource Based View (RBV) perspective of strategic management. The next two sections will discuss these areas of management theory.

Strategic Management

Strategic management involves the systematic analysis of an organisation's external environment, its internal strengths and weaknesses compared to the

environment, and the identification of opportunities to create competitive advantage. From this analysis strategies are developed and implemented (Browne 1994; Robbins, Bergman, Stagg & Coulter 2000). However, the process is highly iterative and probabilistic in nature, as many realised strategies tend to be emergent rather than planned, a view proposed by strategic management author and researcher Henry Mintzberg (Mintzberg & Waters 1985).

The strategic analysis process focuses on the integration of opportunities with distinctive competences. Internal analysis is used to identify assets (resources) and competences (capabilities) currently possessed by the organisation. These will influence the strategic options developed in the next stage of the strategic planning process, as will the external market environment of customers and competitors. External analysis is an intelligence gathering exercise aimed at providing information for strategy development and selection. The objective is to identify trends and events through market analysis that will create opportunities for an organisation, or threats that need to be countered. This requires a thorough understanding of the industry including its products, customers, suppliers and competitors (Aaker 2001; Browne 1994; Robbins et al. 2000).



Management authors Hamel and Prahalad (1989) use the term 'Strategic Intent' to describe organisations that have ambitions beyond their current capabilities. The result is 'an extreme misfit between resources and ambitions' (p. 66), which is a gap that management closes by building or acquiring resources and capabilities.

Assets and Competences. A lack of necessary skills, assets or competences is a key vulnerability or weakness (Pearce II & Robinson 1994; Robbins et al. 2000). Moreover, the existence of redundant assets or competences that consume resources may also be a point of vulnerability (Pearce II & Robinson 1994). A comparison of the essential assets and competences required for an industry with those available internally, will identify market opportunities where internal strengths can be utilised, and internal weaknesses eradicated (Pearce II & Robinson 1994; Robbins et al. 2000). Essential assets and competences will change over time, in line with the progression of the industry life cycle. They are also dependent on the strategies chosen; for example quality strategies and price strategies require different competences (Pearce II & Robinson 1994).

Strategies may be developed around existing assets or distinctive competences through matching them with environmental opportunities (Pearce II & Robinson 1994), or alternatively identify new ones that will be acquired, developed and supported.

In summary, a key aspect of strategic analysis is ensuring the requisite competences are available to an organisation that will support strategic plans. The linkage between organisational strategies and what they are in part based on is discussed in the next section.

The Resource based View of the Firm

RBV regards organisations as a 'broader set of resources' (Wernerfelt 1984, p. 171). It is a perspective on strategic management with an emphasis on internal analysis, and an attempt to address a perceived imbalance with Michael Porter's (1980; 1985) 'positioning' school (Browne 1994). As such, it is a complementary aspect of the strategic management process (Henderson & Cockburn 1994).

Firm Resources. Firm resources include physical, human, and organisational capital (Barney 1991), a mixture of tangible and intangible assets, skills or competences (Hall 1993). Few resources are productive in isolation; productivity comes from the application and coordination of resources. Hence, productivity comes from capability. Grant (1991, p. 119) posits 'While resources are the source of a firm's capabilities, capabilities are the main source of competitive advantage.'

There are many definitions of firm resources; however, for the purpose of this paper the following working definitions are used.

Resources: Stocks of available assets that a firm owns or controls (Ferdinand 1999, p. 22).

Capabilities: A firm's capacity to deploy its resources (Ferdinand 1999, p. 22; Hitt, Ireland & Hoskisson 2001, p. 108).

Simply stated: 'What a firm knows, is a resource' and 'What a firm knows how to do, is a capability' (Zack 1999).

Firm resources in the form of capabilities are developed, integrated, protected and exploited to give competitive advantage (Barney 1991). It is a firm's core capabilities that make the most significant contribution to competitive advantage (Prahalad & Hamel 1990).

RBV theory is based on the assumptions that strategic resources within an industry are heterogeneously distributed, and that they are not perfectly mobile between firms (Barney 1991; Teece, Pisano & Shuen 1997). This is another point of difference from Porter's (1980; 1985) approach to industry analysis, where Porter assumed homogeneous resource distribution and highly mobile resources (Barney 1991). However, resource heterogeneity introduces the concept of resource barriers, which in part are analogous to Porter's (1985) barriers to entry (Wernerfelt 1984). The heterogeneous distribution, when combined with imperfect mobility, is where firms can gain a competitive advantage. Should resources be homogeneously distributed in industry, there would be no difference in: profitability between firms (De Toni & Tonchia 2003); sustained competitive advantage; first mover advantage; and barriers to entry could not exist. If resources were homogeneously distributed, all firms in the industry could conceive of and execute common strategies (Barney 1991; Grant 1991).

Resources and Sustainable Competitive Advantage

Resources are developed or acquired for the purpose of providing a product or service. To add value to an organisation, resources generate customer value, and provide an enduring basis of competition to prepare the organisation for the future. Superior performance comes from a firm's capacity to create and exploit capabilities not available to competitors (Barney 1991).

From the RBV perspective, to provide sustainable competitive advantage (SCA) firm resources: are valuable to the organisation by enabling the exploitation of opportunities and the neutralisation of threats; should be rare, or if possible, unique, in the competitive environment the organisation operates in; should be difficult to copy or imitate; and finally

there should not be substitutes for them (Barney 1991; 1995; Ferdinand 1999; Hamel & Prahalad 1996; Michalisin, Smith & Kline 1997; Porter 1996; Teece, Pisano & Shuen 1997).

The Knowledge Based View of the Firm

In the past decade, the RBV movement has led to something similar called the Knowledge Based View of the firm (KBV) (April 2002; Gehani 2002; Spender & Grant 1996). The basis of the knowledge-based view is that competitive advantage comes from intangible assets such as firm-specific knowledge, the tacit knowledge of its people gained from combining their knowledge, and the ability to create knowledge (Gehani 2002; Grant 1996; Nonaka & Takeuchi 1995). KBV holds knowledge assets, resources and capabilities as the prime strategic resources (Grant 1996; Spender 1996).

Resources such as skills and know-how, capabilities, methodologies, routines, activities, ability to innovate and ability to learn, are all examples of knowledge and the cognitive processes required to deploy knowledge. In these cases, resources are personal knowledge possessed by the firm's people, while capabilities are organisational knowledge, possessed by the firm (Gehani 2002). Grant (1996) posits that firms exist so that individuals, as resources, can integrate their knowledge through the firm's routines, as capabilities.

The notion of knowledge integration is important in that it implies complementary knowledge and not universal knowledge within a firm. Indeed, the transfer of tacit knowledge between all people in a firm would be inefficient (Grant 1996). For example, a production engineer does not need to know all aspects of accounting and finance, nor does an accountant need to know all aspects of marketing. Neither does senior management necessarily know all aspects of a firm's activities. Should this be the case, management are required to trust the decision-making capabilities of their employees, provide an environment where employees are able to take responsibility for their actions, and are allowed to experiment and make mistakes (Spender 1996).

Our discussion of strategic management led us to the resource based view of the firm, which in turn took us to the knowledge based view of the firm. KBV leads us to the nascent discipline of knowledge management, which is discussed in the next section.

Knowledge Management

The perspective of strategic managers who subscribe to the RBV school of strategic management aligns closely with that of many advocates of knowledge management. This alignment is based on an overlap in the area of organisational resources; for example

resources such as information, knowledge, and capabilities such as know-how and tacit knowledge. Knowledge management's purpose, put simply, is the creation of knowledge, and the collection and conversion of individual knowledge into organisational knowledge (Bollinger & Smith 2001; Pemberton & Stonehouse 2000; Spender 1996). As such, organisational knowledge is the sum and product of individual knowledge (Diakoulakis, Georgopoulos, Koulouriotis & Emiris 2004).

Knowledge management's strength lies in its aim to harness the combined knowledge resident in an organisation, for the benefit of the organisation, its customers and its shareholders.

Knowledge management covers a broad range of disciplines including human resource management, communications, philosophy, business management, change management, information management, information technology, sociology, organisational learning, and strategic planning (AS-5037 2003). This research focused on the intangible knowledge-based assets that have been termed knowledge assets (Boisot 1999). The next section discusses knowledge assets.

What are Knowledge Assets?

Knowledge assets comprise a firm's skills, competences and capabilities that it controls, and the way that they are used to create output (Reed & DeFillippi 1990). Skills and competences are part of a firm's portfolio of tangible and intangible assets, and capabilities include the activities and processes through which the assets are understood, utilised and converted into product (Fiol 1991).

Knowledge assets can be broken down into two categories: support or basic knowledge assets; and core knowledge assets. This is similar to the delineation of capabilities into basic and core capabilities, where basic capabilities are not a source of competitive advantage and core capabilities are. Whilst core capabilities are a strategic resource, they need the support of basic capabilities to function.

The predominant view amongst the research subjects was that knowledge assets were people, and that knowledge management was about people, not technology. From the list of potential knowledge assets shown to participants, those that were ranked as the most important all related to people. They included: experienced people; skilled people; people; ability to learn; and social relationships and networks.

What constitutes a knowledge asset is context dependent. For example, theory underpinning practice is only of tangible value when designing the practice. When the practice is actually executed, the underpinning theory is of little real value to the executer. Po-

tential knowledge assets that relate to intellectual property, for example patents, copyrights and registered designs, are also context dependant. These do not apply to all organisations; however, they did rank highly as knowledge assets.

‘This thing “what constitutes a knowledge asset is context dependent”, and I think that’s really an important statement. What constitutes knowledge is context dependent, and the way that people are using that is where it gets its value. ... Only when you make sense of something does it become knowledge.’ (Practitioner 14)

People as Knowledge Assets

There are a number of dimensions to people as knowledge assets. These include: experience, skill, motivation, ability to learn and their social relationships and networks. From an organisation’s perspective, these dimensions or attributes are only of value if they align with or support the organisation’s objectives and add value in some way. For example, some people may be motivated for advancement, but the activities that manifest the motivation are only for their own benefit, and not the organisation’s.

What Influences the Knowledge Assets that an Organisation Requires?

The data collected by this research supports the proposition that an input to knowledge strategies will be the Business Strategy or Business Plan. However, there will be a number of other strategies, eg risk management, human resources, finance and others, that may also provide input to and justification for a knowledge strategy. Of these strategies, the prime strategy is the Business Strategy, with strategies arranged in a hierarchy, for both the organisation and its strategic business units (SBUs) (Argenti 1989).

The link between top-level business strategies and knowledge management plans is not direct; there are a number of steps in between. This is largely due to the probabilistic nature of strategic management. Strategic plans tend to cover longish periods of three to six years. In a changeable environment, plans cannot accurately predict the future over such periods. Such variations in the environment are termed strategic uncertainties (Aaker 2001). As a result, strategic plans will describe what the organisation wants to happen, what its goals and objectives are, but at a high level, sometimes in the form of guiding principles or organisational ‘vision’. It follows that the plan will not be able to give a precise destination, only a range of possibilities.

Initiative and project plans tend to cover a shorter period than strategic plans. Therefore, the ability to

more accurately predict the future outcomes of the initiative is higher, and as such, they are more deterministic than strategic plans. However, predicting the future of any duration will always be subject to error.

Addressing business problems can also be the focus for knowledge asset acquisition. The business problems may comprise current or future capability shortages, preserving organisational knowledge, ensuring that knowledge is available to support knowledge-based business processes, collaboration, and knowledge reuse. Three organisations, all from local government, established knowledge management initiatives or programmes to address problems discovered through applying the Australian Business Excellence framework from Standards Australia. A business problem is often the driver or opportunity for innovation within the public sector. However, the capability to innovate must exist to be able to solve the problem.

How and why are Redundant Knowledge Assets Identified?

The identification of redundant knowledge assets, and their disposal was a contentious and sensitive issue when discussed with public sector practitioners. This was possibly because respondents felt that the most important knowledge assets were people, and there was some sensitivity about ‘disposing’ of people. When asked if the organisation had ever outsourced any functions, all but one agreed that it had been done at some stage. Furthermore, they agreed that this resulted in knowledge asset disposal in some form.

Generally, the Public Sector cannot withdraw from a market unless it is government policy to do so. However, outsourcing is a means for the public sector to withdraw from a market, but still ensure that services are provided, and is a common method of knowledge asset disposal in the public sector.

Outsourcing is a potential knowledge risk from two perspectives. One is the loss of skills and capabilities through outsourcing and the ultimate dependence on service providers for the skills and capabilities. The other is in not adjusting the skills and capabilities of the organisation to adapt to the change of relationship.

Knowledge assets can become candidates for disposal when they are: not being used; no longer needed; or are outdated or superseded. If the knowledge assets are people, disposal may be done by making them redundant, retraining or redeploying them, in which case their existing knowledge, skills and capabilities are not destroyed, but may atrophy through disuse.

‘... if you have people who are really good at learning, then the ability to discard the old and

take on the new, ... is an important feature of learning, of somebody who is a continual learner, who's good at learning, the idea of losing the old and bringing on the new is quite comfortable. And so that means that when you are not talking about knowledge assets disposal about being people, people disposal, you're actually talking about the normal process of regeneration, of someone who's an active learner.' (Practitioner 14)

Knowledge assets can also be disposed of, or destroyed through lack of maintenance. For example no longer updating organisational records and databases where changes have occurred, the practice of no longer updating plans with 'as built' or 'work as executed' drawings; not updating procedures. This situation can present a risk to the organisation through the use of poor quality or defective knowledge assets.

Although none of the organisations studied had formal processes or strategies to identify redundant knowledge assets, knowledge asset redundancy does happen where knowledge is not renewed, maintained or preserved.

Knowledge Asset Disposal

Changes in industry, markets and technology can all render knowledge assets obsolete or redundant. The very knowledge that may have made a firm competitive may become a threat to its survival. The routines and culture that have been developed over an extended period may have to be remade. Firms may have to learn to 'unlearn' (de Holan, Phillips & Lawrence 2004; Hamel & Prahalad 1996). In addition, a firm may have a surplus of knowledge assets. It may have more knowledge that it needs for its current strategies, and hence these knowledge assets are not fully exploited (Zack 2001). As strategies change to suit a changing market or technology, it is inevitable that some knowledge becomes redundant (Teece, Pisano & Shuen 1997). In some cases, this may resemble an 'ongoing process of creative destruction'

(Zack 1999, p. 141), where a firm makes their own and their competitors' knowledge obsolete through developments in technology, business processes or business models. When viewed from the RBV perspective, if competences or capabilities become able to be replicated, emulated or substituted, they will no longer provide competitive advantage (Teece, Pisano & Shuen 1997).

Disposal can be triggered by, or be the trigger for, new knowledge, as the life cycle starts again. Organisational knowledge can decline or decay due to staff leaving, and highly innovative organisations can make their own knowledge and that of their competitors, obsolete. Organisations need to intentionally unlearn as a new life cycle begins (de Holan, Phillips & Lawrence 2004), a phenomenon common to all organisations, firms, and societies, as they all evolve through adapting the knowledge of their members (Spender 1996). An inability to unlearn can reduce the speed with which new learning takes place, potentially favouring efficiency over flexibility, and inhibiting the ability to change (Grant 1991).

What is the Life Cycle of Knowledge Assets?

Knowledge can be both a product and a resource (Skyrme 1998), each of which has a different life cycle.

Following a five-year study into knowledge management practices, Birkinshaw and Sheehan (2002) developed a model for the knowledge life cycle. The life cycle starts with the creation of an idea or concept, often by one person. If the idea creates interest in other people, it moves to the mobilisation stage where it coalesces, gaining substance and value through testing and validation. Should it pass this stage, the idea will then move to the diffusion stage where it becomes more widely understood and valued in the marketplace. Market acceptance will often lead to a well-known idea becoming common knowledge. It is at this point that it is a commodity, the final stage in Birkinshaw and Sheehan's model.

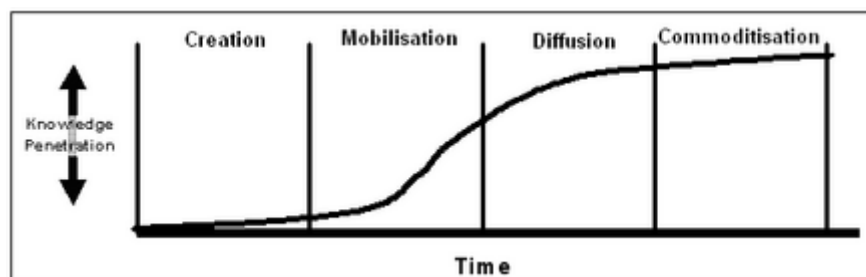


Figure 1: Knowledge Life Cycle – Knowledge as Product, Source: adapted from (Birkinshaw & Sheehan 2002, p. 77)

This research has shown that knowledge assets can also include resources and capabilities, and have a

life cycle more akin to physical assets. The start of this life cycle is when an organisation identifies the

knowledge assets it requires in broad terms through strategic plans, and with greater precision when planning and executing projects or strategic initiatives. This is the start of the life cycle of knowledge assets.

The end of the life cycle is when knowledge assets are no longer required, at which point they may be disposed of, or they may simply atrophy through disuse. Conceptually the skill may exist, but in practical terms may no longer be of a useful standard.

Knowledge assets can also be disposed of or destroyed through lack of maintenance. Without maintenance, knowledge assets will lose value and relevance. Knowledge asset maintenance can be seen as a means of preserving organisational knowledge. Some organisations do this through succession planning with techniques such as pre-departure

mentoring to overcome the loss of knowledge when long-serving staff leave the organisation. Another technique is a type of alumni program where former staff maintain ties with the organisation and participate in activities that are of interest to them.

Figure 2 represents a view of the life cycle of knowledge assets, developed from this research. Starting with when the need for specific knowledge assets occurred, they are then acquired in some way, and deployed or made available. While the knowledge assets are utilised, the need for them is periodically reviewed and a decision made for minor maintenance, major renewal or disposal if they are no longer of use to the organisation, at which time they are retired. As with all activities that consume resources, the life cycle will be monitored so that adjustments can be made when required.

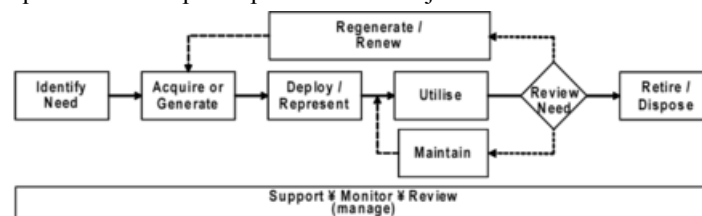


Figure 2: Knowledge Asset Life Cycle– Knowledge as Resource, Source: developed from this research

Through the application of the research findings, figure 1 has been adapted from similar models applied to physical assets, and represents the life cycle

of knowledge assets as an organisational resource. The table below describes each stage in the life cycle in more detail.

Table 1: Life Cycle Stages

Stage ¹	Activities	Tools
Identification of need	<ul style="list-style-type: none"> Scanning for problem / opportunity Verification of problem / opportunity Diagnosis of problem / opportunity (root cause analysis) 	<ul style="list-style-type: none"> People noticing skill or capability gaps Strategic plans The results of innovation Project plans Serendipity Guiding principles Audit
Acquire / Generate	<ul style="list-style-type: none"> Development of alternative options to address the need. Analysis of alternative options Selection of option (proposal) Implementation of selected option 	<ul style="list-style-type: none"> Partnering - collaboration Training people Acquiring new people Documenting routines and procedures Using external consultants Acquiring an existing business Merging with an existing business

¹ Source: Developed from this Research

Table 1: Life Cycle Stages

Stage	Activities	Tools
Deploy / Represent	<ul style="list-style-type: none"> • Making knowledge assets known and available for use • Ensuring the organisation's culture supports and facilitates knowledge sharing and reuse. 	<ul style="list-style-type: none"> • Social and professional networks • Teamwork <ul style="list-style-type: none"> • Communities of Practice • Cross discipline teams • Taskforces • Mentoring • After Action Reviews and 'lessons learned' databases • Expert directories • Codification and storage
Utilise	<ul style="list-style-type: none"> • Ensure knowledge workers have the right information and knowledge when needed • Ensure an organisation has the right skills and capabilities when needed • Solve business problems 	<ul style="list-style-type: none"> • Planning sessions • Manage the knowledge environment, eg. culture, structure, infrastructure, people, leadership, roles
Review Need	<ul style="list-style-type: none"> • Scanning for problem / opportunity • Verification of problem / opportunity • Diagnosis of problem / opportunity (root cause analysis) 	<ul style="list-style-type: none"> • Strategic plans • Project plans • Guiding principles • Market pressures • The results of innovation • Audit
Maintain	<ul style="list-style-type: none"> • Staff development (minor) • Relearning and minor unlearning 	<ul style="list-style-type: none"> • Retraining people • Succession planning,
Regenerate / Renew	<ul style="list-style-type: none"> • Staff development (major) • Significant unlearning 	<ul style="list-style-type: none"> • Retraining people • Replacing people
Manage	<ul style="list-style-type: none"> • Support business processes • Evaluation of decision effectiveness (objective review) 	<ul style="list-style-type: none"> • Balanced Scorecard • Strategic planning • Staff performance reviews
Retire / Dispose	<ul style="list-style-type: none"> • Ensuring that resources are not expended on knowledge assets that are no longer required 	<ul style="list-style-type: none"> • Retraining people – skill atrophy • Replacing people • Selling of or closing down part of the organisation • Dismissing people • Retrenching people • Selling or licensing the knowledge asset • Ceasing maintenance

Conclusion

This research has confirmed, through the interdependence between strategic management and knowledge management, that the strategic management process requires skills and capabilities (knowledge assets) for its execution.

The life cycle of knowledge assets starts and ends when their need or otherwise is identified directly or indirectly by strategic plans. Knowledge assets are acquired, deployed, utilised and maintained until they are no longer needed. They are then disposed of by outsourcing or atrophy when people are re-deployed or retrained.

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Paul is a graduate of Southern Cross University's MBA and DBA programmes. His DBA research topic was the nexus between Strategic Management and Knowledge Management, focusing on the lifecycle of knowledge assets. Coming from an engineering background, Paul has spent the last fifteen years developing and implementing information systems required to support engineering operations in the electricity industry. Dr James is a practicing manager with a large electricity utility, and currently working as the Manager Strategy Development in the corporate strategy group. His previous work experience also includes business continuity planning, and many years as a project manager and project director.

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