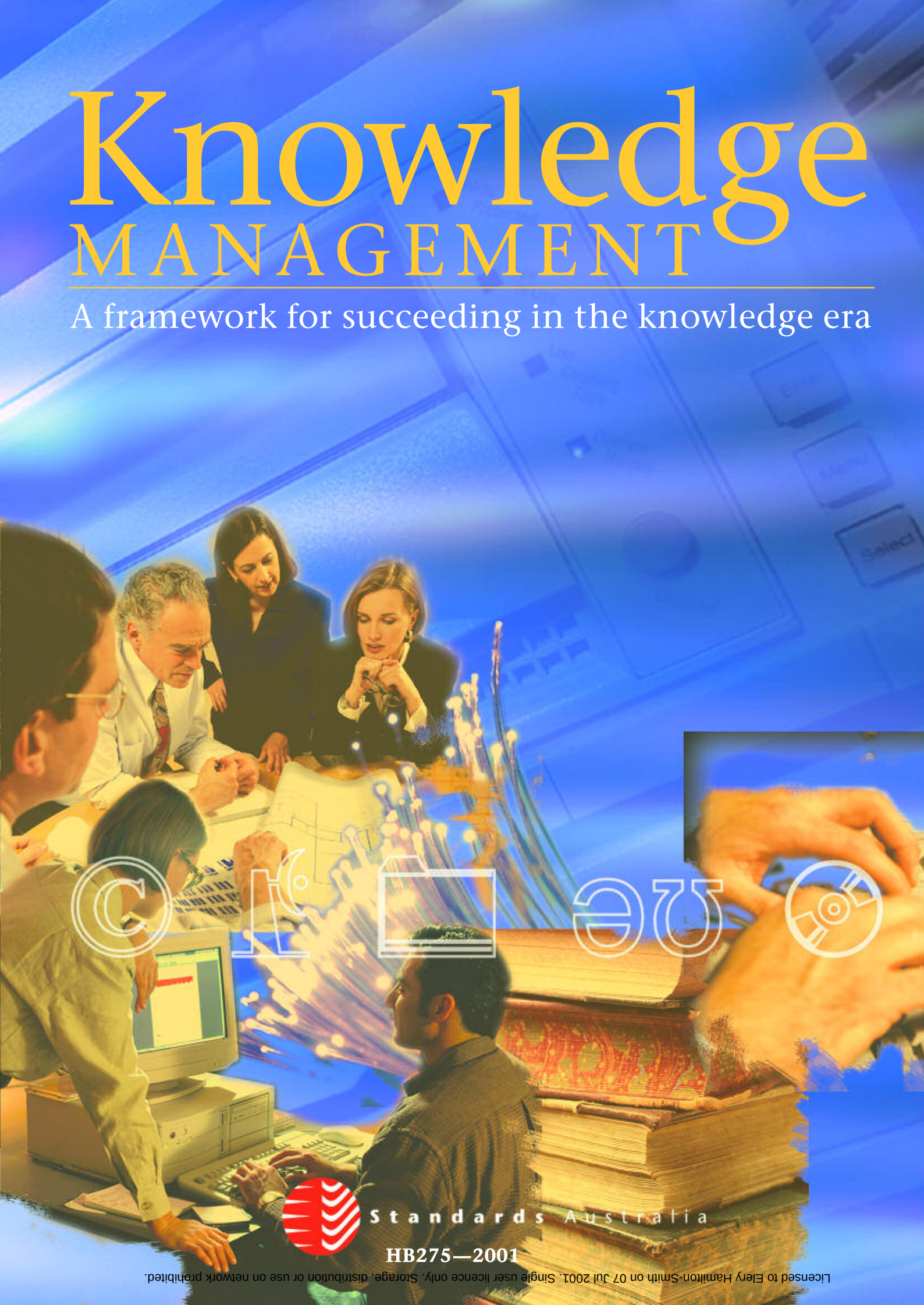
Knowledge MANAGEMENT

A framework for succeeding in the knowledge era



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Knowledge Management:

A framework for succeeding in the knowledge era

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Preface

The Knowledge Management (KM) Framework is published by Standards Professional Services and was developed with the assistance of an online community of knowledge management practitioners—the KM Framework Forum (see Appendix D). Contributions were received from people in a wide range of roles and disciplines, reflecting the diverse nature of the field. The content of this framework builds on the emerging body of international best practise and the practical application experience of the forum members.

It is proposed to use this Handbook as the base document for the development of an Australian Standard. Comment on the Framework is invited and encouraged from readers, and all comments received will be considered during the standard's development process

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Foreword

Mission

The Knowledge Management (KM) Framework is designed to reduce confusion about knowledge management, instil confidence in the value of the field and to assist organisations in its implementation. By considering all the KM elements outlined here, an organisation can have a greater degree of confidence that it is managing its knowledge processes in a comprehensive and professional manner.

The approach to KM

Many influential people and organisations around the world are addressing the field of knowledge management (KM) and this Framework builds on their body of work. The commonly accepted elements of knowledge management have been arranged in logical groupings and connections between them to identified. Relationships with accepted Australian and international standards are also identified.

The content of the Framework is open to ongoing development on our online collaborative environment. The document is rigidly structured (using sections, clause numbers etc) so that each paragraph serves as a discussion point.

Due to the developing nature of the knowledge management field Standards Professional Services has taken the step of placing a number of 'living' appendices on its KM portal at www.knowledge.standards.com.au To view the supporting documents you need to register, free of charge, then log on.

Interpretation of terms

The term 'knowledge management' is not clearly defined in most peoples minds and some people argue that other terms should be considered when describing the discipline. The community participating in the Framework's development found the term 'knowledge management' useful as a widely recognised label that draws together like-minded people recognising a common interest and need.

In this Framework terms like 'information' and 'knowledge' are not defined nor are the differences between them. Indeed, some terms are occasionally used interchangeably where the context of the sentence ensures the message is clear. Knowledge management complements other disciplines such as Records Management, Information Management, Strategic Planning, and Quality Management but we do not delve into the differences or overlaps. In the context of practical KM, we feel it is counter productive to dwell too long on these issues and this philosophy is applied throughout the document.

How to use this framework

In this Framework, the elements of knowledge management are presented in five sections:

- Section 1: Delivering Performance Improvement—This section is designed as a background briefing for senior management. It places knowledge management in the broader business context and provides examples of how organisations are succeeding in the knowledge economy.
- Section 2: Introduction to Knowledge Management—This section provides an overview of the field and provides easy-to-read explanations of key terms and concepts underpinning the framework.
- Sections 3-5: The Framework—The Knowledge Management Framework is expressed in three sections: Knowledge Alignment, Knowledge Processes and Knowledge Foundations.

The appendices outline available technologies, summarise government policies and guidelines and present an overview of risk management. Information that is likely to change rapidly is hosted on our KM portal. Due to the variety of project management techniques, emerging best practices and the unique nature of implementing KM in each organisation, implementation methodologies are dealt with in a separate product.

The knowledge management portal

Further information on knowledge management on our KM portal at www.knowledge.standards.com.au

1 Delivering Performance Improvement

1.1 Succeeding in the new economy

Some organisations are thriving in our increasingly knowledge-intensive world, often referred to as the 'new' or knowledge economy. These organisations are achieving success by focusing on how knowledge can be used to deliver value to the organisation and its stakeholders.

The benefits of being knowledge-focused arise from a fundamental principle — the more knowledge is used the more it grows. As people use organisational knowledge and apply their own unique perspective and experience to it, new insights are gained — more knowledge is generated. Knowledge is thus a resource that increases with use rather than being depleted.

A key challenge of being knowledge-focused is to harness the explosive wealth of knowledge that is generated and ensure it is managed in a way that delivers continual innovation and performance improvement.

Organisations that are succeeding in managing their knowledge processes have certain characteristics that others can strive to emulate. There is no definitive list but general characteristics include:

- A deliberately cultivated culture of sharing knowledge to improve performance.
- Rapid learning capabilities based on the ability to acquire knowledge from outside the organisation and a willingness to unlearn obsolescent practices.
- Innovative and entrepreneurial attitudes facilitated by a collaborative knowledge-creating culture.
- Strong relationships with suppliers, customers and partners based on knowledge exchanges both externally and internally between functions and divisions.
- Fast response and development times facilitated by systems that provide access to the knowledge needed to support decision making.

The extent and speed with which organisations move toward these ideals will vary from organisation to organisation. However, the characteristics form a prototype that all organisations can aim for and they emerge from the application of practices that are outlined in the following sections.

1.2 Knowledge management in action

Organisations increasingly focus on knowledge processes to drive performance improvement. The following brief examples show how some organisations have benefited from this approach. These examples (with the exception of the South Australian Government) come from case studies in our supplementary product called *International Best Practices — Case Studies in Knowledge Management*.

1.2.1 Ford Motors

Ford Motors has implemented a number of knowledge sharing initiatives aimed at driving down the time it takes to get new models of cars and trucks from concept to full production. A best practice replication program shares process improvements among 37 plants around the globe. Individuals and groups suggest improvements by entering a brief description of their best practice into a database and each week the 37 plants receive several best practices that apply to that plant. Knowledge transfer is supplemented with face-to-face exchanges. Each best practice passes through a quality assurance process to ensure the information can be trusted.

A range of other approaches including the best use of intranets and collaboration tools such as computer-conferencing support the best practice replication program. In the five years after the program was implemented more than 2,800 proven practices were shared, helping reduce concept-to-production times from 36 months to 24 months. The value of these improvements has been estimated at US$1.25 billion.

1.2.2 Chase Manhattan

Chase Manhattan Corporation is one of the largest banks in the USA. In 1993 Chase realised its relationship managers were spending too much time extracting customer and product data from bank information systems — time that could be spent generating revenue for the bank by cultivating sales prospects and selling new products to existing customers. In addition, the relationship managers could not accurately determine which aspects of the relationship were making a profit and which aspects were losing money.

Chase established a Relationship Management System (RMS) to minimise the time spent looking for customer data such as credit balance and transactions. The most effective relationship managers were identified and their work practices and experience were analysed. People from other divisions of the bank including risk management and finance division were consulted to ensure the resulting system reflected and supported the real world decisions made by relationship managers.

Since its initial rollout in 1994, the RMS is credited with increasing calls on customers and product sales by more than 25%. It accounts for approximately 15% of the bank's incremental revenues and 40% of its incremental cost reductions.

1.2.3 South Australian Government

Government agencies around the world are facing increasing community expectations of better social services and access to empowering information resources. The challenge for government departments is to manage their internal environment to meet these changing and growing expectations. With 30,000 staff at 800 service locations, the South Australian Department of Human Services turned to knowledge management to deliver service innovation.

The department has adopted a holistic knowledge management strategy that focuses on people, business processes and enabling technologies. Integrating the historically separate streams of health, housing and community services is high on the agenda. A virtual corporate environment was developed using intranet and internet services that facilitated collaboration and integration across disparate sources to deliver knowledge-rich services. Service deliverers and management then used the tools to assist in decision-making.

A key element of the KM strategy is to leverage relationships with external stakeholders and customers. Strategies include integrated analysis of socio-demographic and service usage statistics (previously fragmented). These analyses were used to build web-based knowledge resources. The outcome is that South Australian community and service providers have been provided with equitable and wide-spread access to expert knowledge and can directly contact the right people for service delivery.

1.2.4 Skandia

The Swedish insurance company Skandia grew its gross income in the late 1990s by over 200% in a two year period. It achieved this growth not through acquisitions but by establishing a large number of national and regional offices from scratch. Arising out of a strong focus on the measurement of intellectual capital (human, customer and structural assets), Skandia identified the knowledge requirements of a successful insurance business. It developed a prototyping system for establishing a new office including a set of standard procedures and routines that can be customised — how to administer the products, how to design contracts and set up accounting procedures etc. It supports the replication process with a strong commitment to computer-based training, knowledge sharing and communication systems. It spends twice, and in some divisions four times, the industry average on information technology.

1.2.5 Texas Instruments

In 1994 Texas Instruments could sell more semiconductors than the company could make. At the time it cost US$500m and took six months to build a semiconductor plant and there was no guarantee that the plant's market would still exist when it was completed. The yield from its existing plants was variable so Texas Instruments challenged the plants to share best practices to improve overall yield. The basis for incentives was changed from individual plants to world-wide yield. Business intelligence practices were pursued including a 'Not invented here but I did it anyway' award scheme. It has been estimated that cost

avoidance in terms of building new plants was about US$1.5 billion and the gain on the revenue side was equally high.

1.2.6 Pfizer

Competition in the pharmaceutical industry to reach markets first is intense and Pfizer is using knowledge management practices to beat the industry average. While spending over US$1.7 billion annually in research (1996 figures), only one in millions of screened compounds ever make it to market. Pfizer recognised that if it could manage the research process efficiently it would have a significant competitive advantage. Its main approach involved data mining of scientific publications and other databases to make researchers aware of progress and projects by other researchers. An example of its success was the discovery of the famous impotence treatment drug Viagra. Viagra was originally designed as a drug to fight angina but nurses recorded an unusual side-effect during trials. The side-effect was identified as a trend by a clinician analysing the results.

1.3 Making knowledge work for the organisation

The examples in 1.2 are just a few snapshots of the multitude of ways organisations are using knowledge to improve their performance. With so many different ways of succeeding, organisations must establish for themselves the best way of managing knowledge to achieve organisational objectives. This document is designed to assist organisations establish their own approach.

The examples show that a focus on knowledge leads to demonstrable bottom-line results. The cost/benefit for investing in any knowledge management initiative is demonstrated using the same metrics organisations already use to measure outcomes — whether they be financial, political, social or operational criteria — like Ford Motors driving down time-to-market.

The most common element of organisations that are succeeding in the knowledge era is that they set goals and focus their knowledge management efforts on achieving them. Section 3 of this Framework focuses entirely on aligning knowledge management activities with organisational objectives. Sections 4 and 5 set out a range of knowledge processes and foundations that can be used to achieve the objectives.

The principles in this document can be adapted for use in small, medium and large organisations. Knowledge management can complement other approaches to achieving organisational aims or it can provide an overarching approach to continual performance improvement and innovation. Regardless of the approach taken, KM helps senior management look at their organisation from a different perspective — the knowledge perspective. By focusing on how to make the best use of knowledge, new ways of creating value for all stakeholders can be discovered.

2 Introduction to Knowledge Management

2.1 Executive summary

(a) **Introduction:** Knowledge Management (KM) is a multi-disciplined approach to achieving organisational objectives by making the best use of knowledge. KM focuses on processes such as sharing, acquiring and creating knowledge and the cultural and technical foundations that support them. The aim is to align knowledge processes with organisational objectives. An overview of knowledge management is shown in Figure 1 and explained in the following paragraphs:

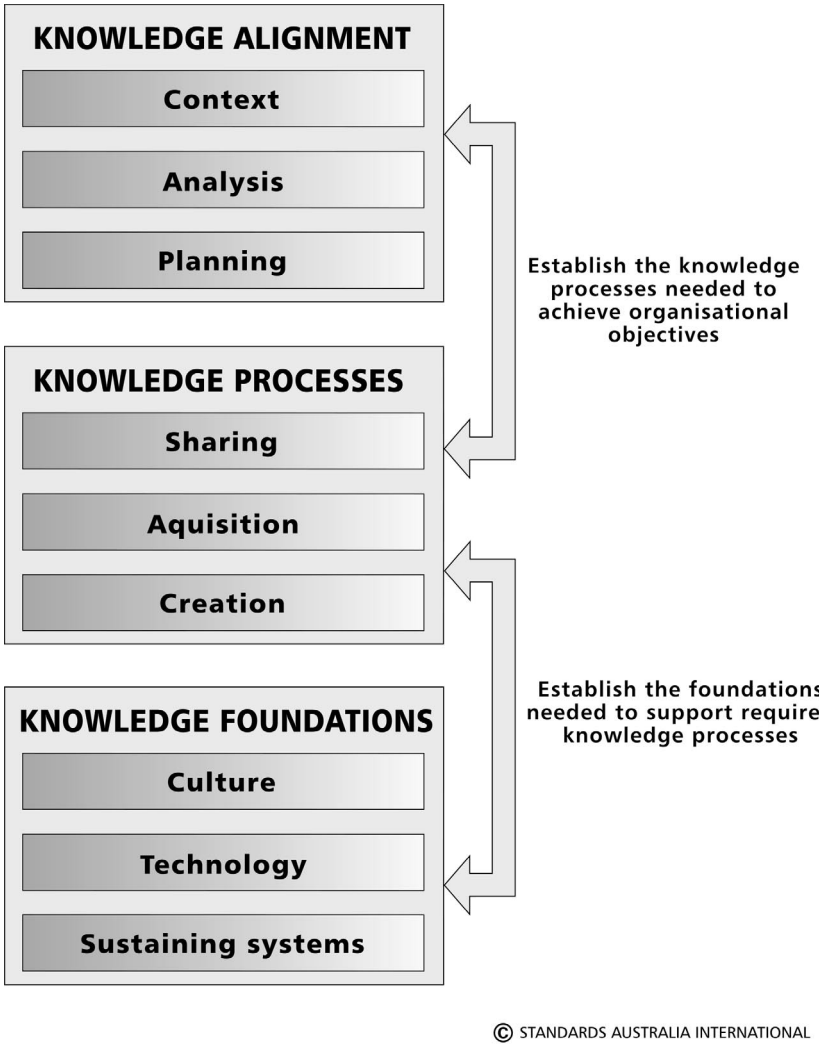


Figure 1: The Knowledge Management Framework

(b) **Knowledge alignment:** The first step is to establish what knowledge management means to the organisation and the context in which it is being applied. Priorities are established and the ways in which KM can help improve performance are identified. The KM options are analysed to determine which activities will deliver the most value. Normal business planning methods are used to establish a business case that includes details on implementation, cost/benefit and how the success of the initiative will be measured.

(c) **Knowledge processes:** The requirements identified in the alignment phase are examined in detail to discover if the knowledge exists internally. If knowledge does exist in-house it can be shared using a range of human and technical approaches outlined in this Framework. If the required knowledge does not already exist in-house it can be acquired from outside the organisation, created from scratch or imported. As options are considered the cost/benefit of each needs to be examined and compared with the priorities established earlier.

(d) **Knowledge foundations:** To ensure that KM is sustainable, the cultural barriers to success must be identified and a change management plan put in place. Once all the knowledge processes and cultural issues have been identified, technical systems that support the required processes are specified and put in place. Procedural systems that support knowledge management activities such as records management, risk management and quality systems are integrated or established.

2.2 Terminology guidelines

It is not critical to absolutely define the following terms and experience has shown it is counter productive to dwell too long on them. Most people have an intuitive understanding of what is meant by many of these terms and plain English guidelines are intended to help organisations adopt definitions appropriate to their own organisation.

(a) **Knowledge management:** People from many different disciplines and roles have made valuable contributions to the field of knowledge management and the range of definitions reflects the diversity of their perspectives. The definitions vary in their approach but almost all focus on the basic concept of making better use of knowledge and have an emphasis on achieving improved organisational outcomes. In developing this Framework, it was identified that successful organisations focus on the processes of managing knowledge as a way of sustaining knowledge-based capabilities. The following definition reflects other definitions and the elements of our own framework:

(i) Knowledge management is a multi-disciplined approach to achieving organisational objectives by making the best use of knowledge — it focuses on processes such as acquiring, creating and sharing knowledge and the cultural and technical foundations that support them. The aim of knowledge management is to align knowledge processes with organisational objectives.

(b) **Data/Information/Knowledge/Wisdom:** Definitions of these terms are endlessly debated but can be generally described as follows:

(i) Data relates to the actual bits and characters in an information system or in other physical manifestations of communication such as sound and temperature.

(ii) Information is data in context that can be used for decision making. Data is usually arranged to provide meaning to the observer. Typically it is arranged as text but could be an image, a film clip, a conversation with another person or even a busy signal on a phone line.

(iii) Knowledge is the body of understanding and skills that is mentally constructed by people. Knowledge is increased through interaction with information (typically from other people).

(iv) Wisdom could be described as the best use of knowledge. Knowledge processes can always be improved but wisdom is necessary to determine which processes to focus on in order to achieve organisational objectives.

(c) **Knowledge dimensions:** There are many ways of looking at knowledge. The most common ways are:

(i) Tacit: Tacit refers to knowledge that resides in a person's mind and can include aspects of culture or ‘ways of doing things’.

(ii) Explicit: Explicit refers to knowledge that has been recorded as information in a document, image, film clip or in some other medium.

(iii) Declarable/non-declarable: Some tacit knowledge is easily recorded but it is often difficult for experts to articulate to others how they perform a task because it happens automatically for them. Such knowledge is termed non-declarable. Even when tacit knowledge is partly-declarable (for example instructional videos on maintenance skills or simulations of landing an aircraft) the expense of converting it to explicit form may not be justified, rendering it economically non-declarable.

(iv) Embedded: Some explicit knowledge is not recorded by communications systems but is still captured by physical systems. The knowledge that goes into the design of a piece of machinery or software is an example of embedded knowledge. Knowledge can also be embedded in the routines and procedural systems of an organisation.

(v) Other dimensions: Knowledge can be classified in numerous other ways including individual, group or organisational knowledge; public or proprietary knowledge etc. Exploration of dimensions relevant to the organisation can be useful to highlight and understand knowledge processes.

(d) **Intangibles:** The intangible assets of an organisation refer to the value of the 'soft' elements of the organisation such as the experience and skills of staff. Intangibles can be better understood by classifying them in groups and subgroups. Many different classification systems are used and organisations intending to employ intangible accounting (see following) approaches should investigate further. A common one is as follows:

(i) Human: Human intangibles refer primarily to employee competencies including their experience, specialist skills, attitudes and values.

(ii) Relational: Relational intangibles refer to the relationships with external people and organisations. They include elements such as reputation, customer loyalty, contract portfolio and the goodwill an organisation enjoys from the public.

(iii) Structural: Structural intangibles refer to unique ways that organisations conduct their business including their management style, computer and technical systems and the proprietary knowledge embedded in its routines and procedures.

(e) **Intangible accounting:** The importance of measuring intangible assets in order to manage them has been recognised and new methods for including intangibles in accounting and reporting systems are being experimented with and developed. The application of intangible accounting depends largely on the style and environment of an organisation — ranging from qualitative executive reports to support the intuition of leaders through to detailed quantitative analysis of performance improvements from year to year. Elements of intangible accounting include:

(i) Intellectual capital: Using intangible accounting it is possible to estimate the economic value of intangible assets (known as intellectual capital) in an organisation. Subsets of intellectual capital include customer capital, human capital and many others.

Increasingly, the public elements of intangible accounts are being published in annual reports.

(ii) Social capital: The World Bank refers to social capital as the institutions, relationships and norms that shape the quality and quantity of a society's interactions (see www.worldbank.org /poverty/scapital for more information). The outcome of these interactions is improved community productivity and well-being. Social capital reduces the cost of doing business and creates opportunity by facilitating coordination and cooperation. It can be measured using a range of indicators including the trust of various institutions and the associational activity of individuals and organisations within a community. Knowledge management can be used to encourage development of social capital at a local, regional or national level.

NOTE : The field of social capital has largely developed separately from intangible accounting but the relationship of all elements of the knowledge economy to social capital is being actively explored.

(f) **Codification:** Codification is the process of converting tacit knowledge into explicit knowledge ready for use by people and systems. The main step in codification is to produce a record (such as a document) that allows knowledge to be transferred independently of its creator. Elements of codification include:

(i) Metadata: Metadata is information about information. The author of a document and creation date are typical examples of metadata.

(ii) Taxonomy: Taxonomy refers to the range of categories or classification schemes that an organisation uses. It is often closely related to the metadata systems adopted.

(iii) Structured/unstructured information: Examples of unstructured information include emails or simple text documents with no styles. Structured information is that which has been organised in a way that allows meaning to be attached to individual parts of the document or asset. For example, documents can be structured by applying styles such as heading levels.

(g) **Other terms:** In this Framework, terms have the following meaning:

(i) Organisation: An organisation is any group of people including a company, business unit, project team, government agency, local community, national government, charity or sports club.

(ii) Stakeholder: A stakeholder is anyone who has an interest in the operation of an organisation. In private companies it includes shareholders, directors, managers, employees, advisors, suppliers and customers. In public or third (eg charity) sector organisations it may include all of the above as well as taxpayers, community members, donators and the recipient of services etc.

(iii) Customer: Customers in this framework refer to any person receiving something from an organisation regardless of whether they are paying for it. Customers can be internal or external to the organisation.

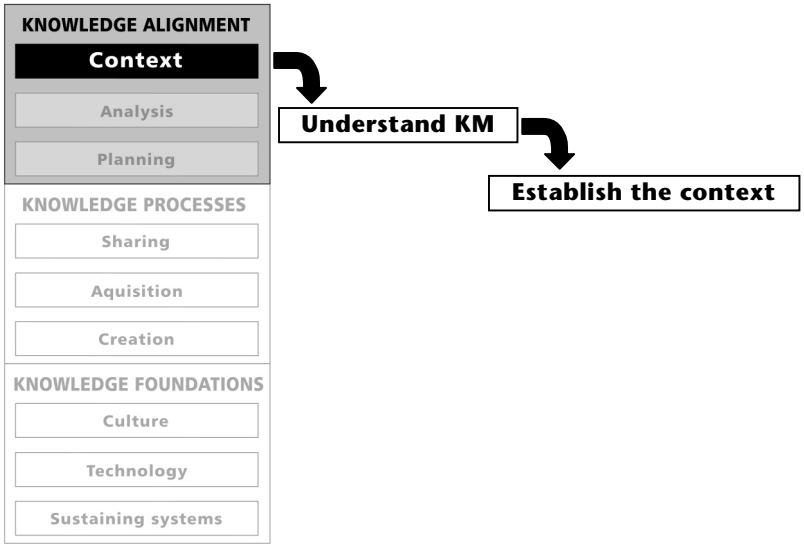
3 Knowledge Alignment

Identify the opportunities for achieving organisational objectives through the better use of knowledge processes.

Successful organisations focus their knowledge management efforts by setting goals. This section outlines ways to establish goals and a business case that demonstrates the benefits to be gained.

3.1 Context

It is important to establish goals that are going to deliver benefits to the organisation and take into account the interests of key stakeholders and environmental influences. This section establishes a general approach to knowledge management and the scope of the initiative.



3.1.1 Understand knowledge management

(a) **Approaches to knowledge management:** Organisations will approach the field of knowledge management in a number of ways and arrive at different destinations. Most experiment and continuously iterate through key stages several times before their KM strategy is mature. This document has been written to assist organisations to develop their own approach to KM.

(b) **Understand KM:** The first step is to develop a clear understanding of what KM means in the context it is being applied. As an organisation's

experience with knowledge management increases, understanding of its application and how it can be used to achieve organisational objectives will grow.

(c) **Engagement:** A key element to successful KM implementation is to engage stakeholders including staff, management, board members, customers and partners. Organisations should develop an effective communication strategy that will assist in achieving commitment, managing expectations and building understanding of requirements among suppliers such as consultants and vendors.

(d) **Story telling:** Because of the new concepts inherent in knowledge management, KM practitioners should consider a story-telling approach to communicating key messages to stakeholders. Messages can include where the organisation has come from; where it wants to go; significant milestones; or the general approach to KM. Story telling devices include illustrative images, engaging presentations, analogies and metaphors, and models. The following example of 'The KM journey' is one example that can be used. As this document is read, ideas specific to organisations should be captured and developed.

(i) The KM journey: The concept of a 'KM journey' can be used to manage expectations of what to expect as knowledge management is introduced to an organisation (see Figure 2). Narrative for a typical KM journey may articulate stages such as realisation that core problems are not being solved with current technical and managerial approaches. Milestones could include pilots and management commitment to KM as a strategic imperative. Elements of KM could be woven in including the importance of addressing cultural challenges. A vision the of future may be included, which is as specific as a new product or it may be the achievement of continuous innovation.

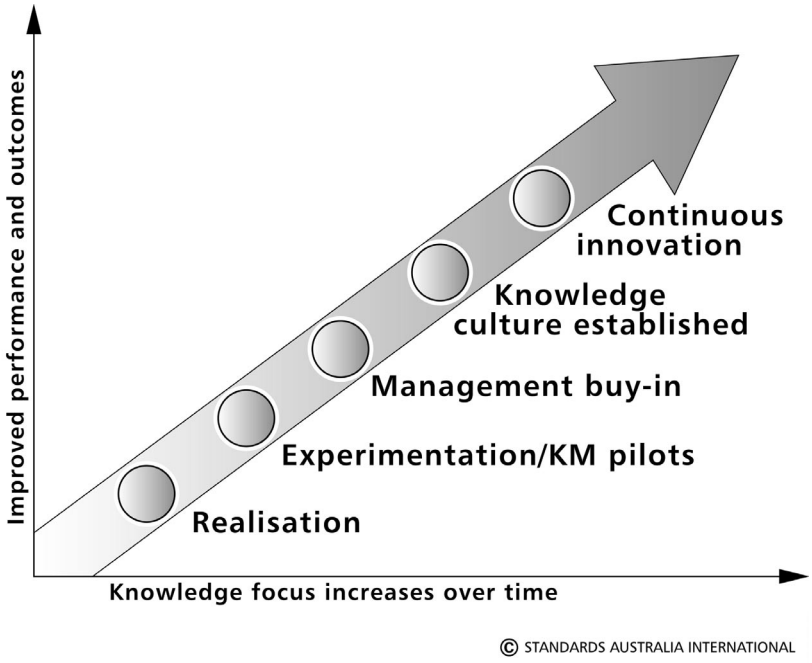


Figure 2: Example of a story-telling device — The KM journey

3.1.2 Establish the context

(a) **Introduction:** Knowledge management can deliver value to most organisations operating in a variety of contexts. Establish the general rationale for adopting KM. Consider the following:

(i) Profit motive: KM can be used by private sector organisations to deliver value to shareholders and customers. It can also be used to address health and safety, environmental responsibilities or other organisational issues.

(ii) Community objectives: KM can be used by public and third sector (charities etc) organisations to deliver definable social outcomes. It can also address organisational issues such as public accountability privacy issues and liability.

(iii) Social capital: Local communities, regional and national governments can build social capital by using KM to improve the quality of their economic, environmental and social environments.

(b) **Environment:** Identify the broad factors that influence the operation of the organisation. Consider the following:

(i) Stakeholders: Identify key stakeholders and their interests.

(ii) External environment: Characterise the external environment including competitors, changing customer requirements and other influences that impact on the organisation's objectives.

(iii) Internal environment: Characterise the internal environment including an overview of human and structural knowledge resources and the levels of capability and competence they represent.

(c) **Strategy and operation:** Outline the strategic positioning of the organisation including vision, mission, issues, goals and action plans. Identify any operational goals that are to be addressed by the knowledge management initiative.

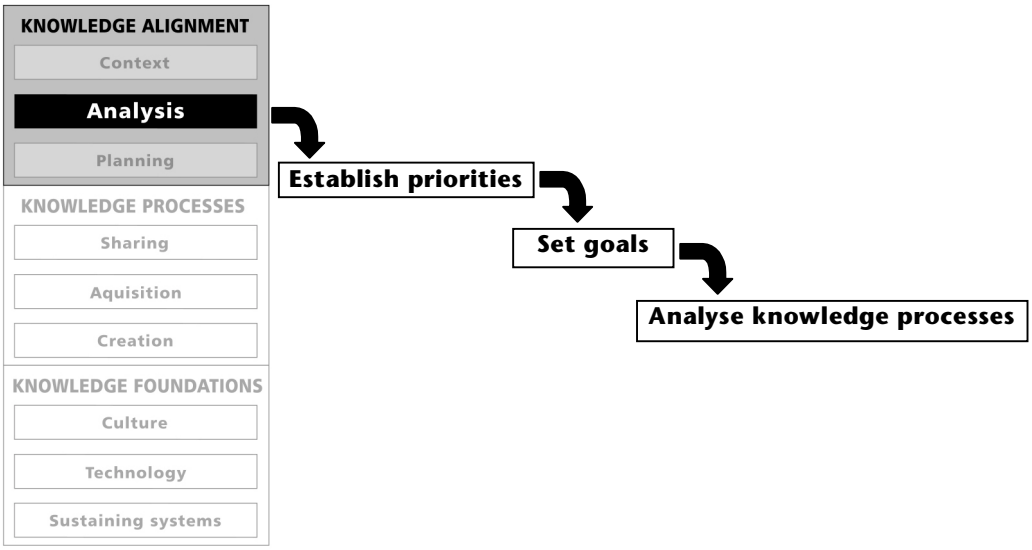
(i) Consider how knowledge management supports and fits into the organisation's strategic planning processes. Knowledge management can complement other approaches to achieving organisational aims or it can provide an overarching approach to continual performance improvement and innovation.

(ii) Outline the scope of the knowledge management initiative. For example KM can be applied at a process, divisional or organisational level. Also clarify whether knowledge management is to be implemented on a project-by-project basis or as a cultural change initiative.

(iii) Apply a SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis, scenario planning or some similar method to ensure that all strategic considerations are accounted for.

3.2 Analysis

It is important that the knowledge management initiative has clear directions. This section establishes a list of priorities and goals that deliver benefits to the organisation. The broad knowledge processes that can be used to help achieve the goals are identified.



3.2.1 Establishing priorities

(a) **Planning processes:** For many organisations, knowing where to start is one of the most difficult elements of knowledge management. Where organisations have established planning processes, KM can be used to determine how knowledge processes can be best used to achieve objectives. Where planning processes do not exist or do not provide opportunity for practitioners to contribute knowledge management proposals, an opportunity and risk management approach to establishing KM priorities is set out in the following paragraphs.

(b) **Manage opportunities and risks:** Risk management is a rigorous methodology that can be used to establish organisational priorities. Systematically identify, analyse and treat opportunities and risks that may affect the achievement of organisational objectives. An approach to managing opportunities and risk is set out in the Australian Standard on Risk Management (AS/NZS 4360:1999).

NOTE : The term risk is usually associated with negative events that have an adverse impact on an organisation. However, it equally applies to positive risks associated with new ventures and organisational directions. For example, achieving ambitious new goals can benefit from a consideration of the possible scenarios in which they would not be achieved. It is easy to dismiss risk as not appropriate to the positive approach of knowledge management but a rigorous application of risk management will enhance any KM proposal.

Consider the following:

(i) After establishing the context in the previous section, the criteria by which risks and opportunities will be evaluated and measured

need to be established. The range of possible events and their root causes are identified. The likelihood of events happening and the consequences if they do, are analysed using qualitative or quantitative techniques. The level of opportunity and risk they pose is then estimated. The risk levels are compared to the evaluation criteria and the events are then ranked, with high likelihood and consequence in important criteria given the highest ranking. Organisations can then determine how to treat, avoid or retain the risk. (See Figure 3 and Appendix C for more detail.)

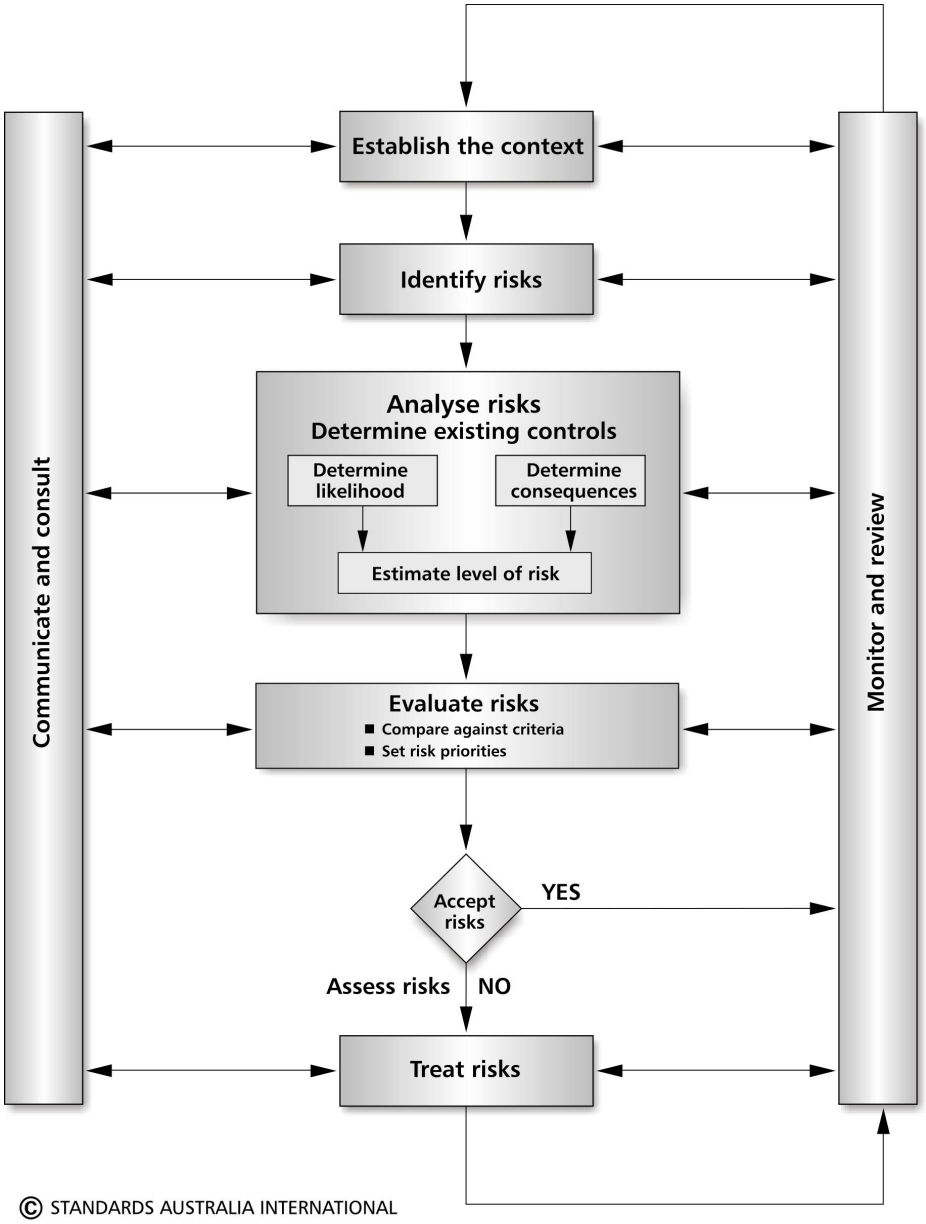


Figure 3: The Risk Management process

(ii) Knowledge management can be used to treat risks by reducing the likelihood of adverse events or enhancing the likelihood of positive events. Likewise, KM can be used to reduce the consequences of

negative events or capitalise on the benefits to be gained from positive events.

(iii) As processes and environments change new risks arise. Organisations should encourage a cultural awareness of risk so that new risks are identified and treated as they arise.

3.2.2 Setting goals

(a) **The process approach:** Identify the business processes of an organisation including any activity that transforms inputs into outputs. Processes often cross divisional and functional borders involving people from every level and area of the organisation. The advantage of this approach is that by focusing KM activities on existing business processes with defined and measurable outputs, real value is delivered to the organisation. Then analyse them to identify:

(i) The business processes with the highest total risk and opportunity.

(ii) The inputs, outputs, participants, stakeholders, guidelines (eg contractual or regulatory), performance measures and the major activities that are undertaken.

(iii) Potential process performance improvements

(iv) A shortlist of proposals that can be subjected to knowledge analysis.

(b) **Establish goals:** Successful organisations focus their knowledge management efforts by setting goals. Having established the context, organisational priorities and key business processes organisations should set goals that address the interests of all stakeholders. A balance needs to be struck between quantifiable goals and other goals that are not so easily measured. Many of the issues established during the risk analysis and 'soft' assets such as employee competencies are important to achieving objectives but are not so easily measured.

(i) Establish a framework of objectives based on the criteria established in the risk assessment. The objectives framework should include all quantitative and qualitative goals that are important to achieving overall organisational objectives.

3.2.3 Knowledge Analysis

(a) **Introduction:** Once a shortlist of proposals has been prepared, each proposal needs to be examined in more detail. The knowledge processes needed to treat opportunities and risks and to achieve organisational objectives should be identified. A general approach, as illustrated in figure 4, is to:

(i) Examine the risks, opportunities and activities associated with each business process in greater detail to ensure that all possible knowledge requirements have been identified. Use a range of traditional techniques such as root cause analysis, SWOT, brainstorming, systems analysis etc. Combine the outputs of the root cause analysis with the process knowledge requirements identified earlier and compile a list of knowledge processes.

(ii) Establish an agreed set of terms (taxonomy). An organisational taxonomy facilitates exchange of knowledge, allows indications of tacit knowledge to be meaningfully interpreted and fosters relationships by establishing common interests. See Section 4.1.2 (c) for more detail on establishing a taxonomy.

(iii) Briefly characterise the knowledge processes identified to establish a realistic view of the size and scope of the knowledge requirements, including the number of people involved, geographical considerations etc.

(b) **Analysis:** Identify the elements of required knowledge that already exist in the organisation as well as existing knowledge processes. A wide range of mapping techniques can be used to assist this process including surveys, interviews, focus groups etc. Include an assessment of existing explicit systems in the survey.

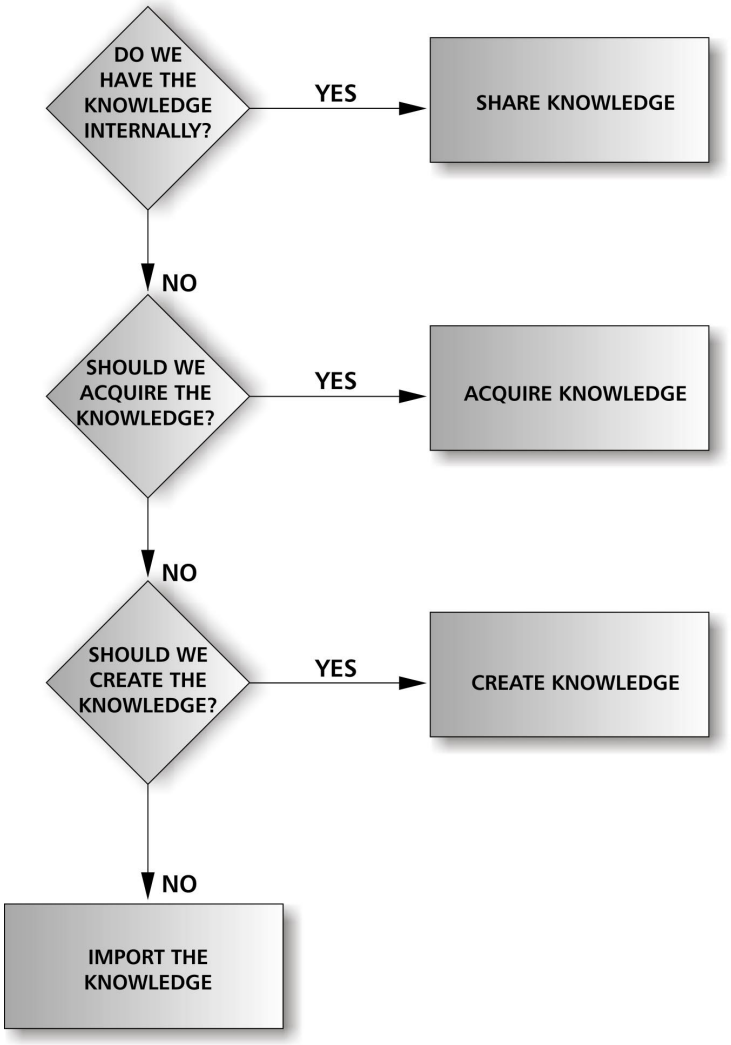


Figure 4: Knowledge Analysis

(i) Sharing: Where required knowledge already exists in the organisation, determine how it can be shared and used effectively to address the organisational objectives — refer to the following tacit knowledge analysis and the options in Section 4.1.

(ii) Acquisition: If required knowledge does not already exist in the organisation, determine if it can be feasibly acquired from outside the organisation — refer to Section 4.2.

(iii) Creation: If knowledge does not already exist in the organisation, and after first considering if it can be easily acquired, determine if it is strategically advisable to create it within the organisation. If the required knowledge is aligned with the core business processes of the organisation determine how best to create it — refer to Section 4.3.

(iv) Importing: If it is not strategically advisable to create the knowledge in-house, then the required knowledge will need to be sourced by putting in place arrangements with external suppliers. (see Section 4.2.2)

(c) **Tacit analysis:** Much tacit knowledge can be converted to explicit form (eg with the use of advanced tools such as simulators for more difficult-to-declare knowledge) but it is not always justified. The challenge for organisations is to determine how strongly tacit knowledge aligns with organisational objectives and the cost-benefit of converting it. Establish procedures for identifying the nature of the tacit knowledge and the methods that will be used to share it. Consider the following conceptual approach:

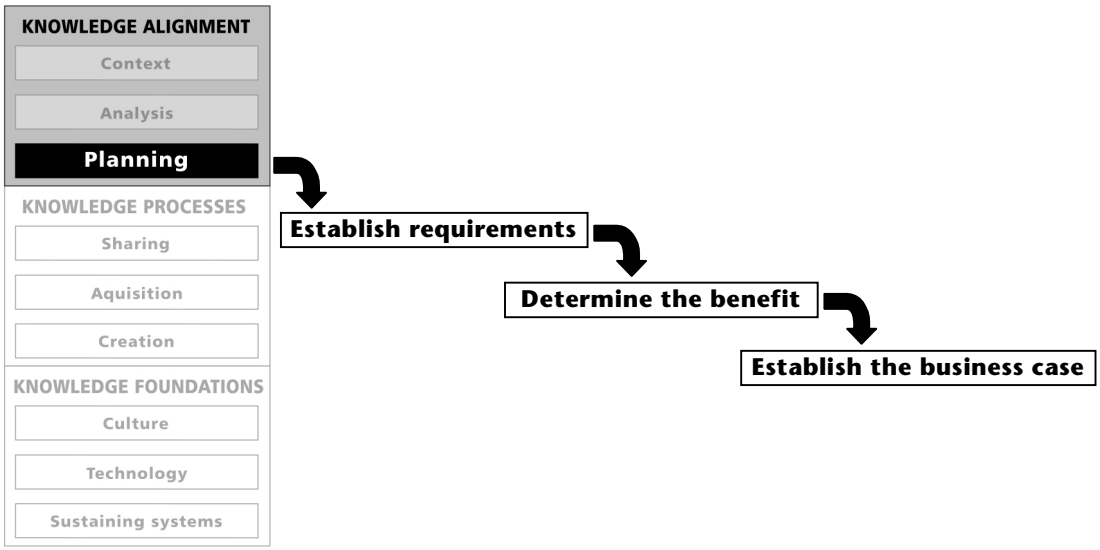
(i) Convert declarable tacit knowledge: Where tacit knowledge is easily declarable and strongly aligned with organisational objectives, convert it to explicit form.

(ii) Indicate non-declarable tacit knowledge: Where tacit knowledge is not easily declared and is aligned with organisational objectives, develop procedures to indicate its presence so that it can be discovered by people using explicit knowledge retrieval systems. Methods range from staff entering key words that give indications of their knowledge through to dedicated tacit knowledge interviewers who can fully characterise the knowledge and establish procedures for sharing it.

(iii) Share non-declarable tacit knowledge: Where tacit knowledge is not easily declared and the expense of converting it to explicit form can not be justified but it is still aligned with organisational objectives, develop a strategy for tacit-to-tacit sharing of knowledge. Methods selected (ranging through buddy systems and class training) will depend on the importance of the particular expertise to achievement of organisational objectives.

3.3 Planning

The knowledge management initiative must deliver real value to the organisation and this section is designed to help organisation establish a business case. The business case establishes the broad requirements that will be examined in Section 4 and Section 5.



3.3.1 Establishing implementation requirements

(a) **Introduction:** There are a number of planning techniques available to assist the implementation of knowledge management initiatives and this Framework does not attempt to outline them. The following content examines those planning elements that are important in knowledge management. Whatever approach is used, a business case should be established that aligns knowledge processes with business processes.

(b) **Technology:** Specifications for technology should be developed only after all other elements of knowledge management have been considered. See Section 5.2 and Appendix A for more detail.

(c) **Change management:** Because culture plays such a strong role in knowledge management it is essential that a change management plan be in place to ensure the success of any initiative.

(i) Demonstrate the need: Demonstrate the need for change and identify the benefits delivered to all stakeholders.

(ii) Address the root causes: It is important to understand the root causes underlying the need for change and address these. Many projects fail because of a lack of appreciation of the amount of effort required to achieve real change.

(iii) Develop an effective change plan: Analyse the full scope of the initiative and clearly identify the cultural challenges and risks that need to be addressed (See Sections 3.2.1 and 5.1). Prioritise the resulting list into smaller achievable steps. Establish a change plan including recognition and reward schemes that will address the

challenges. Set up procedures to identify and add any new behaviours that emerge that need to be changed.

(iv) Manage the change plan: Do not underestimate the magnitude of implementing and sustaining change. It requires ongoing activity from management to deliver change that sticks. Suggestions relevant to KM are found in Section 5.1.3 -Cultural Management.

(d) **Plan-Do-Check-Act:** Organisational processes are themselves subject to change, so any defined alignment of KM with organisational objectives will have to change with the processes. The alignment process will be iterative so processes will need to be revisited on a regular basis. A commonly used planning approach is Plan-Do-Check-Act:

(i) Plan: Establish the objectives and processes of the proposed knowledge management activity.

(ii) Do: Implement the knowledge management activities that support the organisational objectives.

(iii) Check: check to see if the activity is delivering the expected benefits and that the processes and objectives remain the same.

(iv) Act: Capture what has been learned in the last cycle and determine ways of improving the knowledge management activities.

3.3.2 Determine the benefit

(a) **Cost/benefit analysis:** Not all knowledge management activities can be justified. In most organisations a return on investment (ROI) or net present value (NPV) needs to be estimated for any particular proposal. While criteria for measuring success can be financial, care needs to be taken to ensure that a focus on quantifiable outcomes does not distract organisations from addressing other important issues that are not so easily measured. Establish an approach for measuring the success of knowledge management initiatives. Consider the following:

(i) Use the criteria established in the previous context and analysis sections to establish broad metrics for success. They could be financial, operational, social criteria, or combinations of these. Use the criteria identified to apply a cost/benefit analysis to each shortlisted proposal.

(ii) Where justifiable, take measurements before and after implementation of any project. Follow-up measurements at regular intervals may be appropriate.

(iii) The value of knowledge management is measured by the achievement of organisational objectives. The extent to which an organisation wishes to separate the contribution of knowledge management from other activities will vary with its level of confidence in the field and is dealt with in the intangible accounting paragraphs following. If necessary, use the cost/benefit analysis to compare knowledge management with other ways of achieving the same objectives.

(iv) Risk management can also be used to determine if a proposal is justifiable. If the risks treated by the proposal have a relatively high likelihood and/or a high consequence then it is necessary and

justified to treat them. If it can be demonstrated that knowledge management will treat the risks more effectively or efficiently than other methods then a business case can be established.

(b) **Intangible accounting:** Knowledge management can also be justified by measuring changes in the intellectual capital of an organisation. Determine the elements by which intellectual capital will be measured (see the terminology guidelines). Also, determine the general approach to be used. Consider the following:

(i) Improvements in organisational performance can be measured very simply by choosing key performance indicators (KPIs), such as customer satisfaction, and comparing them on a year-to-year basis. Alternatively, the KPIs can be weighted according to their impact on organisational objectives and organised into groups for which indices can be established and used to track improvements. There is a range of commercial tools available to assist this process.

(ii) By assessing the relationship between financial transactions and human activities, it is possible to establish a relationship between the earnings/costs and the impact of knowledge management (as opposed to other activities that help achieve organisational objectives). If an organisation considers this important then a payback and profit analysis in real terms can be established.

3.3.3 Establishing the business case

(a) **The proposal:** The nature of knowledge management proposals will vary greatly from organisation to organisation with proposals being largely dependent on where the organisation is on the 'KM journey' (see Section 3.1.1). Consider the following:

(i) Avoid 'quick wins' that do not achieve organisational objectives. However, if the organisation is at an early stage of the KM journey, do choose smaller (manageable) projects that achieve organisational objectives and demonstrate the benefits of knowledge management.

(ii) Focus on organisational objectives and operation goals, not KM objectives. Understand the organisation's strategic objectives and the concerns of the organisation's leadership.

(iii) Work towards an organisation-wide knowledge focus with a process-by-process approach.

(iv) Identify milestones on the KM journey that have been previously established. Manage expectations about the impact of knowledge management by defining the realistic benefits to be achieved at each milestone. Monitor progress through the KM journey and celebrate reaching key milestones.

(v) Apply a SWOT analysis to the proposal to identify any major considerations not already picked up by the analyses outlined in the previous section and the earlier contextual SWOT. Test proposals using scenario planning or other similar methods.

(vi) Ensure the organisation's quality procedures identify new processes or improvements to existing processes and that these are addressed from a knowledge management perspective.

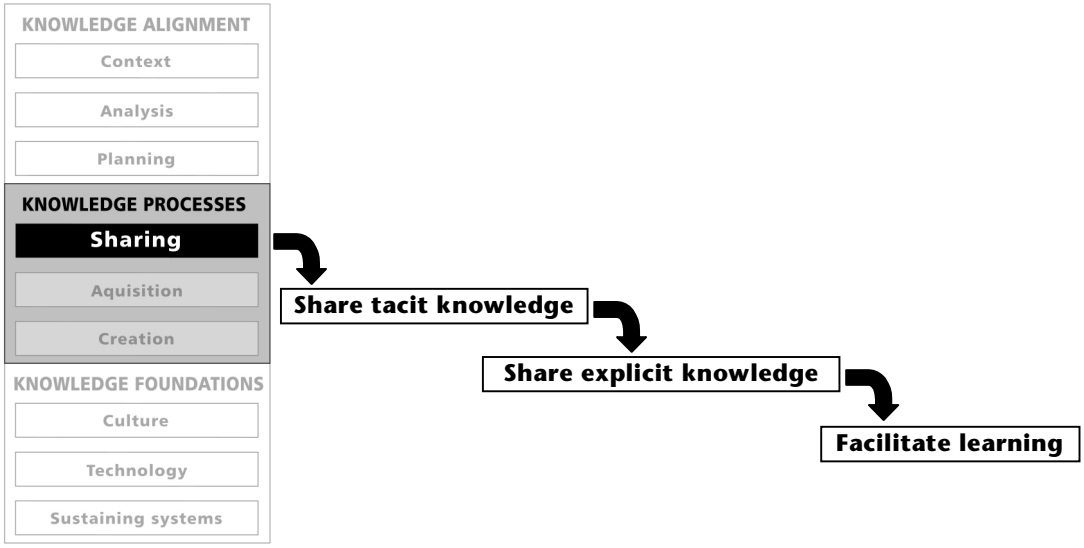
4 Knowledge Processes

Establish the knowledge processes needed to achieve organisational objectives.

There are numerous ways to share, acquire and create knowledge. It is important to establish the most appropriate knowledge processes. The aim of Section 4 is to guide organisations through the options and identify specific processes for inclusion in knowledge management initiatives.

4.1 Knowledge sharing

It is important to identify ways of sharing knowledge that are justifiable in the business case. This section outlines that options for sharing that can be used in the knowledge analysis of Section 3.2.3.



4.1.1 Tacit knowledge

(a) **Introduction:** There are numerous ways of sharing knowledge. At every step, KM practitioners need to refer to the outcomes of the alignment phase to justify the approaches adopted. In particular refer to the tacit analysis in Section 3.3.1 to establish if tacit knowledge should be shared. The following paragraphs provide suggestions for sharing.

(b) **Tacit-to-tacit sharing:** Tacit-to-tacit sharing broadly refers to sharing of knowledge directly from person to person without the need for knowledge to be made permanently explicit in any detailed way

(although whiteboarding and other methods are often used). Consider the following:

(i) Direct sharing: Encourage direct peer-to-peer sharing of knowledge. Knowledge tends to lose meaning and depth in transmission. Many knowledge systems aim to minimise the amount of explicit knowledge and refer enquiries to the author. Most humans communicate more efficiently face-to-face and where it is justified this should be encouraged. Time management training should include estimating the value of each face-to-face meeting.

(ii) Appoint boundary spanners: Boundary spanners are people whose skills or knowledge span a wide range of disciplines. Hence they see collaboration opportunities more easily than people whose knowledge is more narrowly focused. Boundary spanners should be involved in a wide range of projects to promote cross-fertilisation and awareness.

(iii) Mentoring and coaching: There are a number of variations on mentoring and coaching. In general, more experienced personnel should provide support and advice to staff who are learning new knowledge and skills.

(c) **Tacit to explicit:** Where knowledge needs to be shared over time or distance, tacit knowledge often needs to be converted to explicit knowledge. There are a wide range of methods for capturing knowledge. The main consideration is to make knowledge capture as easy as possible and a part of normal business activity rather than a separate event. Also consider the following options.

(i) Facilitators: Many organisations assign people to capture tacit knowledge, especially during the course of projects. These people should be trained communicators and facilitators specialising in the dissemination of best practices. They should be conversant with the full range of knowledge management options available in the organisation. Their activities should be integrated with the information quality suggestions outlined below.

(ii) Knowledge indication: The existence and location of tacit knowledge can be indicated in a number of ways, usually by links from explicit knowledge resources to a tacit knowledge directory. Knowledge directories include information such as the skills and experience of people and can be used to support a range of knowledge processes. For example, directories can be used to validate the qualifications of people contributing to knowledge repositories, making comments in annotated documents or participating in online discussion groups.

(iii) Annotation facilities: Provide facilities that allow staff to comment on (annotate) explicit knowledge resources such as documents. Annotation tools allow authors to include commenting points, either automatically or manually. Automatic insertion of comments is usually at key features such as new paragraphs. (For example, the reason each paragraph in this Framework is identified by a number or letter is to facilitate its ongoing development in our online collaboration environment. Members of our KM Framework

Forum can click on the '(iii)' at this paragraph and give us comments on the use of annotation facilities.) Consider methods for ensuring comments are acted on where appropriate.

(iv) Induction and exit strategies: Establish a strategy for identifying mission critical skills and knowledge of key staff. The strategy should include a methodology for determining what knowledge to capture or transfer to other staff. Include knowledge contributions in this area as a key element of a performance review so that it is not left to the last minute before staff leave, when their motivation is low. Also consider tapping the fresh insights of new employees by capturing their suggestions for performance improvement.

(d) **Explicit to tacit sharing:** There is a wide range of methods available to create or increase tacit knowledge using explicit knowledge resources. These are outlined in more detail in Section 4.1.3.

(e) **Quality of information:** Develop methods to ensure that knowledge shared is of value to achieving organisational objectives. Consider the following:

(i) A peer review system can be used to ensure that only contributions in line with organisational objectives are accepted. The quality of the contributions can be evaluated so that appropriate levels of recognition and reward are granted.

(ii) Provide links to information about the contributor including their experience and responsibilities. This will allow users to access the quality of the information source.

(iii) Where taxonomy systems are used (ie classification), empower creators to classify their own content at the time of creation. The knowledge owner knows best the most appropriate classification and this approach avoids duplication of effort. Classification is most accurate recorded close to the time of knowledge creation.

(iv) Include maintenance systems (see the discussion of quality and records management in Section 5.3). Maintenance systems should include basic metadata such as the date knowledge was entered and disposal procedures.

(f) **Actively encourage sharing:** Go beyond passive measures and actively encourage sharing behaviours. The cultural aspects of sharing are detailed further in Section 5.1.

(i) Establish a policy that ethically encourages staff to capture, indicate or share tacit knowledge acquired in the course of their general activities. Establish the accountability and rights of staff and the organisation.

(ii) Normalise the process: Tacit to explicit conversion or indication should occur during the normal course of business activities, not as a separate activity.

(iii) Provide time: Where declaration or indication of tacit knowledge requires careful thinking appropriate time needs to be allocated. This will be proportional to how hard the knowledge is to declare and its importance to organisational objectives.

(iv) Environment: Provide environments conducive to sharing. Consider the use of physical areas such as lunchrooms, off-site locations and online communities. See Section 4.3.1 (b).

(v) Provide tools: Tools for converting or indicating tacit knowledge should be easy to use, integrated with normal working procedures and consistent with the organisation's wider KM technology foundations (see Section 5.2).

4.1.2 Explicit knowledge

(a) **Introduction:** Explicit knowledge can be found in many places within an organisation — including databases, network folders, messaging systems, customer relationship management facilities, directories and records management systems. The range of explicit knowledge can be managed in ways that add value to it and facilitate discovery in a variety of contexts including formal training, during customer transactions, in context-sensitive help applications or simply by serendipity. Consider the following:

(i) Explicit knowledge systems should primarily be established to support business processes that have clear organisational objectives. Making knowledge 'more accessible' is generally not a justifiable reason for investing in technology or procedural systems.

(ii) Not all tacit knowledge needs to be made explicit. Tacit knowledge that needs to be made explicit should be identified during the alignment process.

(iii) Recognise that explicit knowledge is often embedded in the routines of the organisation. Where business processes are not subject to rapid change, consider establishing procedures that reflect the knowledge.

(iv) Embedded knowledge is also found in other forms such as machinery and software. This needs to be managed in a similar way to explicit information — for example by maintaining records of the experts who designed machinery and software and managing the maintenance of embedded knowledge.

(v) In considering the following paragraphs, keep in mind that many explicit knowledge processes can and should be automated.

(b) **Information discovery:** There are a wide range of ways in which people can gain access to knowledge. Organisations should identify the access methods required to support achievement of organisational objectives. Following are some basic modes of information discovery:

(i) Known-item searching: When a person is looking for a specific item, full-text search engines can be used to retrieve documents or other explicit information using a specific word or term. Searching by categories can be better used to better direct searches toward resources aligned with organisational objectives.

(ii) Goal-based searching: People may know their problem or challenge but not the resources they need to help them. Search techniques using natural language queries can be employed here. Alternatively browsing (see Site Design below) a well organised site

or strategic links between documents will help direct people to known resources.

(iii) Context sensitive: People are often not aware of whole topics of knowledge. Information needed to understand a task or piece of information may be linked to a knowledge resource. In this way the existence of knowledge is made known to staff as it is needed.

(iv) Learning: A range of learning methods require access to knowledge resources. In this case information can be organised so that staff can browse through it or be employed in some other learning experience.

(c) **Taxonomy:** To identify the knowledge requirements it is often beneficial to establish an agreed set of terms (taxonomy). An organisational taxonomy facilitates exchange of knowledge, allows indications of tacit knowledge to be meaningfully interpreted and fosters relationships by establishing common interests. Consider the following:

(i) Determine the extent to which the organisational taxonomy should be formalised. Often taxonomy is intuitively developed and may be sufficient for initial stages of the KM journey. Also, there is a significant maintenance burden that must be accounted for. The extent to which the taxonomy is developed should take into account the earlier cost benefit analyses and should be repeatedly applied as proposals for new levels of taxonomy are proposed. Also the nature of the knowledge should be accounted for. Taxonomies are more appropriate for mature, well-understood processes rather than rapidly changing environments.

(ii) Start by establishing a strategic taxonomy based on the context established earlier, progress to terms associated strongly with the organisational objectives and processes and ensure that the operational taxonomy (the lowest level of detail) is correlated with these. Ensure key stakeholders are consulted to ensure the taxonomy reflects their interests.

(iii) The terms and labels chosen to classify knowledge need to be consistent, unambiguous and in language that people will understand. Use a glossary to explain terms and where appropriate, make this easily available. Use a thesaurus to link terms with similar or identical meanings that may have been created to cater for different audiences.

(iv) Control the addition of new categories in a flexible manner so that the needs of specialist groups and changing requirements in the organisation are met without allowing the organisational taxonomy to become disorganised. Put in place processes (such as a review committee) to update the organisational taxonomy at regular intervals or upon request.

(v) Account for the various dimensions of knowledge such as perspective (individual, group, organisation), type (tacit, explicit, embedded), location (internal, external, cross-border) and application (strategic, managerial or operational).

(d) **Metadata:** Metadata (information about information) can be used for a range of purposes in knowledge management. Purposes include fielded

retrieval (eg searching by category); personalisation and reuse of text (eg deploying content to multiple website locations or displaying different content to different users); records management (eg metadata for expiry dates etc); and business-to-business knowledge exchange (metadata specifying the characteristics of a part). Where appropriate and justified, metadata should be attached to explicit knowledge. When developing metadata strategies consider the following:

(i) Be consistent with the organisational taxonomy but provide flexibility and mechanisms for staff to update the metadata list.

(ii) Ensure metadata is applied in a way that does not inhibit the normal activities of people in the organisation. Provide simple tools for staff to attach metadata to a document where appropriate and automate this process wherever possible.

(iii) Where appropriate ensure the classification occurs as close to the time of creation as possible and input by the author.

(iv) Where appropriate, empower groups of staff to create metadata schemas for their own purposes that do not conflict with organisational schemas. Establish mechanisms for self regulation so that metadata does not proliferate out of control.

(v) Where a records management system is in place, ensure that your metadata strategy is consistent with it and industry norms to ensure that legal, evidential and accountability requirements are met.

(vi) Consider automatic classification systems. With appropriate 'training', these systems are able to scan large volumes of text and identify concepts and apply metadata without human intervention. The quality of the metadata applied will vary depending on a wide range of factors. This approach is most appropriate when there is a high volume of information that needs to be continuously classified.

(vii) Business to business (B2B): Part of knowledge management may involve the exchange of information with external business partners. Wherever possible, the metadata strategy should adhere to industry norms (a list of industry metadata schemes is maintained on our KM portal) to facilitate easier information exchange.

(e) **Structuring information:** Structuring explicit information is the process of divorcing the content from its presentation. For example, structuring a document involves identifying content types within the document and attaching metadata to text with that content type. Simple examples of content types are 'sub-heading', 'hyperlink', 'client name' or 'part number'. Marking up content allows those types to be presented and behave differently in different media and situations. Where justified in the alignment phase, structuring of information should be considered for the following cases:

(i) Personalisation: Content needs to be personalised. For example, depending on who is logged on, hyperlinked text may change colour, go to a different destination or not appear at all.

(ii) Multiple media: Information needs to be presented in multiple formats such as print, web and mobile phones. Also, information needs to be stored over long periods of time so that its presentation is independent of the technology it was created in or the media it was created for.

(iii) Dynamic content: Modules of information needs to be re-used in multiple locations or modified frequently. For example, a document can be dynamically constructed from multiple content sources and elements of information within it can be kept up to date by referencing a database.

(iv) Other benefits of structuring information include consistency of presentation; higher productivity through familiarity with conventions; and ease of effecting large scale changes to content behaviour and presentation.

When developing a markup strategy consider the following:

(v) Ensure the markup strategy chosen is independent of the technology platform. Content should be re-usable by other applications in a format that preserves all of the markup information.

(vi) Where appropriate, content should be stored in a format that allows an organisation to extend metadata and markup languages to meet their specific needs.

(vii) Structuring of documents can be simply achieved using word processing styles and it is recommended that an organisation-wide markup strategy be established as a matter of good knowledge management practice.

(viii) Ensure that the organisational markup strategy takes account of relevant industry norms such as accepted metadata schemes. (See the Standards Australia KM portal for links to these).

(f) **Quality:** The information coming out of a KM system is only as good as the information going in.

(i) Put in place procedures to ensure that content and classification are correct and of sufficiently high quality to meet the needs of knowledge systems. Consider the use of a peer review system. Include appropriate metadata, such as date created and date for disposal.

(ii) Include links to the credentials of people entering knowledge into an explicit repository so that viewers can evaluate the context with which the knowledge was entered.

(iii) Where appropriate, track changes to explicit knowledge resources accounting for reasoning behind the change, who made the change and any other appropriate metadata. This is particularly important where the risk assessment reveals a possibility that knowledge used to support advice or a transaction may be challenged in a court. Consider the use of a records management system.

(iv) Update the repository regularly. Where possible automate the process of removing documents from the repository using criteria

such as expiry dates or lack of use. Consider promoting the prominence of information that is frequently used. Keep in mind legal issues such as regulatory requirements to retain records. In most governments it is illegal to dispose of records without disposal approval. Refer to Section 5.3 on Records Management for further detail.

(v) Market mechanisms can also be used to maintain the quality of the information. Commonly used information can be promoted to higher prominence and rewards/recognition given to the author. Infrequently used information can be demoted and eventually removed.

(g) **Site design:** In knowledge management there is often a need to guide a person through complex repositories of information. Make sure that the site design leads staff to portals of information on topics that are aligned to achieving organisational objectives. Consider the following:

(i) Organisation schemes: Choose from alphabetical, chronological, geographical, topical, task-oriented and audience-specific organisation schemes, combinations of these or any other appropriate schemes.

(ii) Navigational elements: Navigational elements can be global, local to sub-sites, embedded links in text or specific to a document with links automatically generated according to the metadata (eg links to a portal or other similar documents)

(iii) Labelling systems: Ensure terminology is consistent with the organisational taxonomy. Link to a glossary of terms.

(iv) Search facilities: Search facilities should take into account site design, taxonomy and metadata to provide advanced searches that narrow the search range, thus providing more accurate results. See information discovery in 4.1.2 (b), for more detail.

(v) Graphic design should be employed to ensure an easy and intuitive navigational experience.

(vi) Safety nets: When a person does not find what they are looking for a link to further approaches (such as the services of a librarian, records manager or subject specialist) should be detailed.

4.1.3 Learning & training

The education industry has developed numerous ways of increasing the effectiveness of learning. In the context of knowledge management, learning strategy goes beyond competency-based training to systematic learning of knowledge needed to achieve organisational objectives.

(a) **Learning methods:** The techniques chosen to teach staff will have a large impact on the success of the training. Knowledge managers are tending to mix and match delivery methods where appropriate. The following are some examples of learning methods:

(i) Classroom training: The advantage of instructor-led training is that learners benefit from real-time, personal engagement with the trainer and others in the training course as the material is being

presented. Disadvantages are the lack of personalisation and that the cost of delivery increases with the number of people trained and the number of geographical locations. Classroom training can be combined with on-the-job-training or other learning systems to enhance knowledge transfer.

(ii) E-learning: Also known as computer-based training, e-learning is a general term referring to a range of learning systems making use of the web, CDs and other electronic systems. This type of training caters for different skill levels and knowledge requirements and allows learners to work through the material at their own pace. Disadvantages are that participants must be self-motivated to complete the training on their own.

(iii) Simulated learning: Simulations and role-plays of the situations in which the knowledge and skills will be applied are powerful learning tools because they allow the learner to practice and apply the knowledge and skills being learnt.

(iv) Precedents: Worked examples and case studies allow staff to see the process involved in solving real problems of the past. Learners can discover the principles and procedures involved and then apply these to their current situation.

(v) Context sensitive learning: Staff can click on links to further information resources on a topic, and in some cases to links to short courses that can be taken as required.

(vi) Formal programs: Many organisations have formal learning programs that staff can apply to enter. These programs provide a mixture of organisation-specific content and general material from external training providers. Some larger organisations go so far as to have these internal courses recognised by external educational institutions.

(b) **Instructional design:** The following principles apply to the design of any instructional learning environment. In particular it can be applied to e-learning material.

(i) Encourage the learner: The aim of all learning programs is to achieve high completion rates. Course designers need to consider motivation and incentives to complete a course such as matching the challenge levels of content to pre-existing knowledge, setting of deadlines and development of community spirit.

(ii) Explain what is to be learned: Students need to understand up front what benefits they will derive from the course. In all cases the pay-off for completing the course must exceed the difficulty of undertaking the course. Difficulty includes all intangibles, such as time and frustration associated with setting up a computer to participate, as well as tangibles such as financial cost. The courses should be structured to continually emphasise what has been learned so far and what is still to be learned. This will prevent attention from wandering which is so easy on the web.

(iii) Build on previous knowledge: Associate lessons with knowledge already in long-term memory. This will greatly enhance retention.

For example, integrate a choice of appropriate case studies that students can relate to.

(iv) Engage the learner: Learners should construct some product of the learning such as a report or an analysis that makes them think about the lesson. Ideally this product should be something that can be applied in their workplace. Students also need to reflect on what they are learning, and need to prepare assignments that make them think, such as an essay that answers a well-crafted question.

(v) Provide guidance: The learning material should be structured to meet the needs of different sections of the target audience. Care needs to be taken in designing navigational elements that guide the user to the most appropriate modules. Materials should also require the learner to regularly make informed choices, reinforcing comprehension and retention.

(vi) Provide community: People learn most effectively when they have the opportunity to interact with other people interested in the same topic. With e-learning this most often takes the form of discussion groups either by email or in web-based chatrooms. Threaded newsgroups are also an effective alternative so that students can follow threaded conversations.

(vii) Test comprehension: An appropriate form of testing should be devised. This can range from online multiple-choice tests where the student sees immediate results through to assignments that can be posted or emailed to an examiner. Include pre-testing so participants and managers can measure improvements. Where appropriate assess against criteria to determine if further training is needed.

(viii) Remediation: Courses should provide links to further material if the participant wants to find out more. Links should include access to more challenging reading as well as links to further material for learners who have difficulties with comprehension.

(c) **Effective knowledge transfer:** For learning to be effective it must be directly relevant to people's job and the knowledge must be used. Some suggestions to ensure that knowledge is absorbed and used include:

(i) Learner involvement: Include typical and leading-edge learners in the process of designing learning material.

(ii) Articulation of knowledge: Where a critical need for knowledge transfer between people from different disciplines and departments has been identified, ensure that knowledge is articulated in a way that can be easily understood by the intended audience. This may require input from communication specialists, such as journalists, graphic designers, instructional designers, and facilitators.

(iii) Provide feedback: In extended courses, feedback on the learner's progress should be provided during the training and when they are back on the job. Feedback should be specific to each learner.

(iv) Apply immediately: So that knowledge is retained, new skills should be applied immediately in the work place. Adults like to

learn through doing, so theory sessions and other types of training should be interspersed with application of the skills.

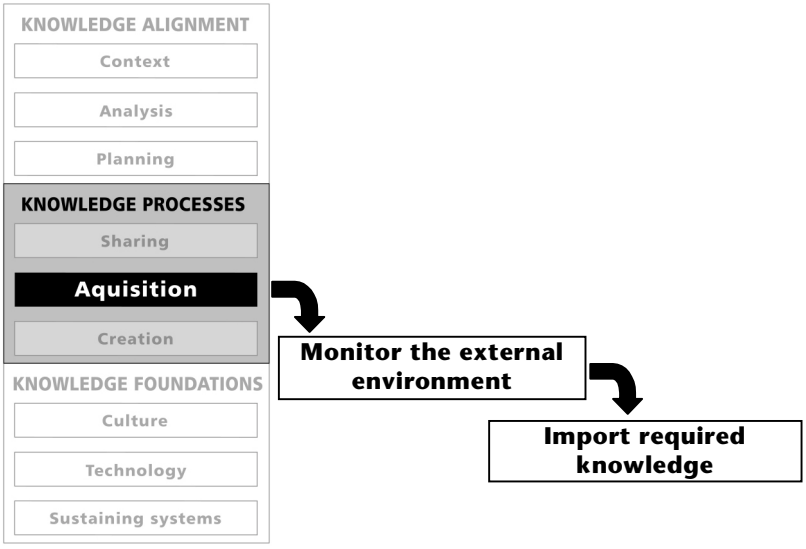
(v) Modular learning: Provide multiple entry and exit points to a learning system consisting of a range of modules. This approach allows staff to manage their own learning by learning only what they need, when they need it and choose material that builds on prior learning. Courses can also be personalised where appropriate.

(vi) Follow-up training: Follow-up should be conducted after the completion of training to ensure that staff are applying the knowledge and skills correctly. Additional assistance should be offered where necessary.

(vii) Provide multiple practice examples: It is important to provide multiple examples that are directly related to the learner's activities during the course of work. This will allow the trainee to identify the features that are example-specific and those that reflect general principles that transfer to all problems of the same type.

4.2 Knowledge Acquisition

When knowledge required to achieve business aims does not exist in the organisation the options for acquiring it from outside the organisation need to be examined and justified in the business case. In most cases organisations will also want to monitor its external environment in order to manage risks. This section sets out the range of knowledge acquisition options.



4.2.1 External monitoring

(a) **Monitor strategic context:** Organisations need to be continually aware of the environment in which they operate. Ensure that all major elements of the strategic context established in Section 1.1 are monitored. In particular, be aware of initiatives of similar organisations and employ benchmarking methods where appropriate.

(b) **Competitive intelligence:** Competitive intelligence is the use of legal methods and techniques that provide organisations with knowledge of the environment in which they operate. It is a mature discipline with well-established methodologies focused on the active acquisition of knowledge about the external environment of any organisation. The aim is to provide information for management to make informed decisions. Techniques include observation, deduction and a range of analytical tools.

(c) **Market research:** Use traditional market research techniques such as focus groups and consumer surveys as means of collecting data and feedback for analysis.

(d) **Customer feedback:** A range of techniques exist to capture feedback from customers. Strategies range from capturing postcodes of customers and call centres logging frequently asked questions, to encouraging all staff to manually input feedback from clients.

(e) **Professional participation:** Ensure that staff participate in conferences, association activities and subscribe to relevant journals etc.

4.2.2 Importing knowledge

(a) **Knowledge resourcing:** The following examples for importing knowledge will be familiar to most organisations. Knowledge management provides a rationale for choosing which options to use. Organisations should develop a knowledge-based resourcing model that enables an enterprise to optimise the selection and use of knowledge suppliers both inside and outside its boundaries. The model can be used to tailor contractual arrangements with external suppliers and to build appropriate internal organisational structures. Options for importing knowledge include:

(i) Contracting consultants: Experts and consultants can be utilised when the organisation has a need for certain knowledge or skills. Any such contract should include clauses to provide for capture of knowledge generated in the course of the contract.

(ii) Employment of experts: If the organisation identifies a continuing need for using experts or consultants in certain knowledge areas, then action should be taken to internalise that knowledge (by hiring permanent employees or training existing staff).

(iii) Flexible staff hire: Where knowledge exists widely in the public domain flexible staff hiring options including part-time, and temporary workers and contractors should be considered.

(iv) Organisational acquisition: Where the knowledge required to build a new capability is missing, one option is to acquire another organisation that has the necessary capabilities. A knowledge audit should be undertaken to ensure that the knowledge resources of the target organisation are complementary.

(v) Strategic alliances/Joint ventures: The organisation may also identify other organisations which possess the knowledge needed and establish a strategic alliance, joint venture or some form of collaborative arrangement. Part of the exchange will be arrangements for the sharing of knowledge.

(b) **Leveraging external relationships:** Relationships with external suppliers/partners can be enhanced by a better understanding of how they can contribute to enterprise knowledge goals. This should result in more effective contractual arrangements, covering elements such as:

(i) Formalised arrangements for knowledge transfer.

(ii) Capture of knowledge created during the course of the contract.

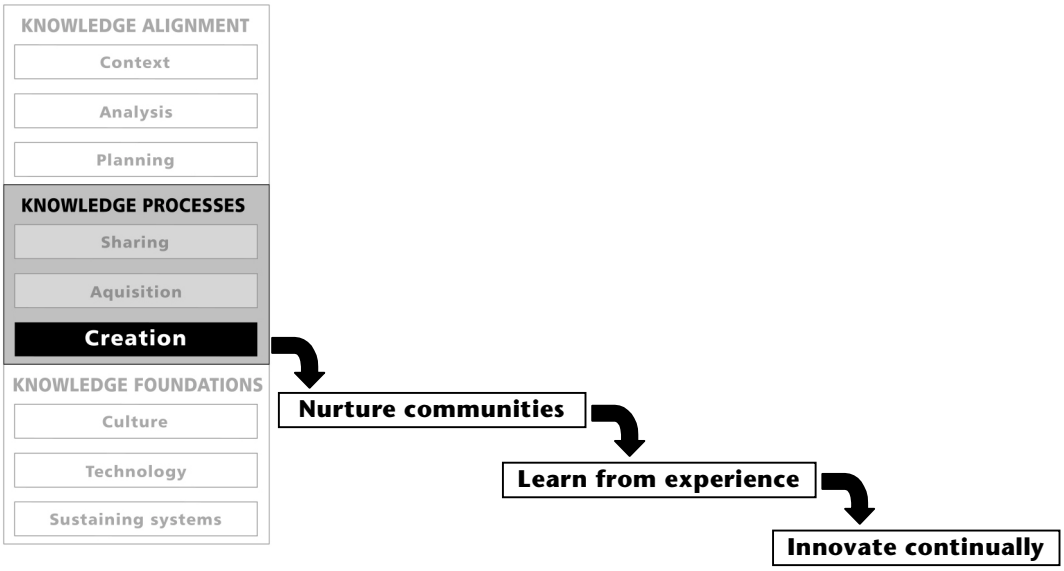
(iii) Re-use of knowledge created during the course of the project.

(iv) Pro-active co-creation of new knowledge.

(v) Agreement on rights and responsibilities with respect to intellectual capital existing prior to the relationship.

4.3 Knowledge Creation

When knowledge required to achieve organisational objectives can not be feasibly acquired from outside the organisation it may be justifiable to create it internally. This section sets out the range of knowledge creation processes.



4.3.1 Knowledge creating communities

(a) **Knowledge creation processes:** New knowledge is created when people interact. As people share knowledge, new insights are gained and ideas crystallise into new concepts. The concepts can be explored, refined and tested before being shared across the organisation or embedded in products and services. Two strategies for creating knowledge include:

(i) Create formal communities to achieve specific organisational objectives. Establish the broad boundaries and specifications of what the community must achieve (it could be a product/service prototype, a process improvement etc) that will focus the knowledge creating activities of the community.

(ii) Encourage informal communities of interest that meet no immediate need but generate and capture a stream of ideas that provide multiple options for future organisational directions.

(b) **Building and nurturing communities:** Establish the foundations by which communities can achieve the expected objectives.

(i) Recognise leaders: Community leaders play a vital role in building and nurturing groups. They should be trained, allocated time for their community activities, recognised and rewarded for achieving outcomes.

(ii) Resources: Allocate resources as justified in the earlier analyses that allow multiple collaboration techniques including shared electronic workspaces, conferencing facilities and face-to-face meetings. Include training to teach team members to work productively together.

(iii) Physical environments: Recognise the importance of knowledge exchanged during casual meetings. Consider creating environments and policies to encourage this. Encourage the proximity of team members where knowledge creation is an essential part of achieving the organisational aims.

(iv) Choosing community members: When choosing multi-disciplined teams to work on a problem, the selection procedures should consider a person's specialist skills, background and personality types. Choose people with differing views and backgrounds to see problems from a different perspective, thus sparking new ideas for approaching problems.

(v) Knowledge fairs: Consider the use of regular 'knowledge fairs' as a way of establishing new communities that might not have been obvious. Knowledge fairs are events where the organisation brings employees together at a physical location. Employees or groups create simple displays outlining new ideas, processes or any other knowledge they have created or acquired. This semi-formalised interaction can provide a fertile ground to spark new ideas and collaboration opportunities.

(vi) External collaboration: Where appropriate, ensure that external people can participate including suppliers, partners, customers and other stakeholders.

(vii) Internal competition: Where the cost of parallel efforts can be justified, consider establishing competing internal teams as a creative stimulus for generation of new knowledge, especially when external pressure is not strong.

(c) **Community platforms:** In many cases communities need to be supported by technical foundations so that knowledge generated by the group can be discovered by others and preserved over time. Develop systems that facilitate the sharing of knowledge created by the community. A range of tools exists specifically to support communities or they can be supported by simpler mechanisms such as a web site administered by the community leader. Consider the following:

(i) Shared desktop environments.

(ii) Shared project workspaces.

(iii) E-groups (email based list servers).

(iv) Web-based portals.

4.3.2 Learning from experience

(a) **Activity-based learning:** Ensure that projects (and any regular activities that present opportunity for learning) have procedures in place to capture knowledge before, during and after the activity. Consider the use of after-action-reviews to capture knowledge in a way that facilitates learning-before-doing activities.

(b) **Pilot projects:** Learn from pilot projects in a systematic manner and apply these to subsequent activities.

(c) **Organisational memory:** Consider pro-active strategies for teaching staff key lessons of the past, including reasons for successes and failures as well as what has been tried before and in what circumstances.

(d) **Exit strategies:** Ensure staff continually update a knowledge base that is designed to maintain an organisation's capability to achieve its objectives. Consider making contributions to the knowledge base a key element of an annual performance review. Consider linking the knowledge contributions to an automated induction program for successors.

(e) **Variance analysis:** Whenever unusual events occur (either positive or negative), subject them to a root cause analysis to determine the factors behind them. Determine the lessons to be learned and effect change where appropriate.

(f) **Act on lessons learned:** Organisations learn best if the feedback loop is short. Put in place procedures to review and act on the lessons learned. Modify or put in place new organisational processes where necessary.

4.3.3 Innovation

(a) **Introduction:** A general aim of creation activities is to deliver new knowledge that provides a strategic capability. In the private sector, the aim in achieving an objective might be to create unique knowledge that can not be easily imitated by competitors. In the public sector, the aim might be to create holistic understanding of previously intractable issues and deliver knowledge that helps resolve the problems. The characteristics of created knowledge vary by application and organisation but can be identified during the alignment phase.

(b) **Prototyping:** A common approach to innovative knowledge creation is the use of prototyping. In this scenario the organisation conducts market research to determine the characteristics of a new product or service that will be successful. A prototype sets the boundaries and broad specifications and the organisation then sets out to acquire the knowledge that will allow them to realise it. Similarly, in vision-led knowledge management, an organisation's leadership might characterise what the organisation will look like in the future and then put in place plans to realise it.

(c) **Experimentation:** Organisations should pro-actively experiment with new processes, services or products frequently, even when the organisation is currently successful.

(d) **Research:** Basic research and development work should be undertaken where it is aligned directly to organisational objectives. Research indirectly related to organisational objectives should be supported with appropriate contractual arrangements to capitalise on any discoveries.

(e) **Joint ventures and alliances:** Determine how much scope there is for valuable co-creation of knowledge.

(f) **Knowledge mapping:** Some organisations conduct knowledge mapping exercises specifically designed to identify opportunities for innovation based on unidentified knowledge already in the organisation. Such mapping exercises should be focused on discovering high levels of expertise, which have the greatest opportunity of delivering valuable new approaches.

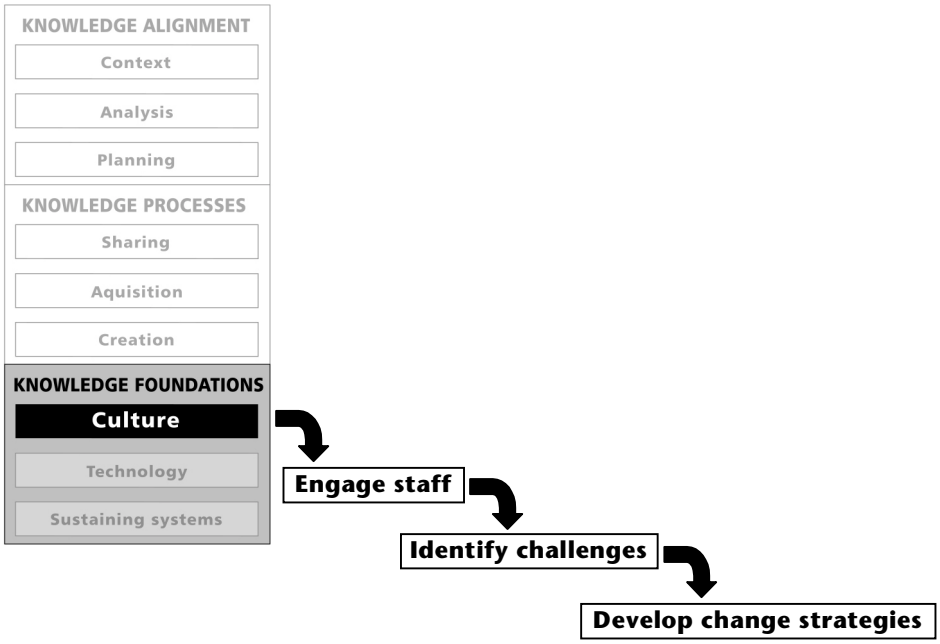
5 Knowledge Foundations

Establish the foundations needed to support required knowledge processes.

For knowledge management initiatives to succeed, sound cultural and technical foundations must be put in place. This section outlines some of the foundations required to ensure knowledge management initiatives are sustainable.

5.1 Knowledge Culture

Cultural barriers to success need to be identified and addressed for knowledge management to be successful. This section sets out typical challenges and options for addressing them.



5.1.1 Engaging staff

(a) **Introduction:** Organisational culture consists of the language, values, attitudes, beliefs and customs of an organisation. One aim of knowledge management is to encourage the emergence of a knowledge-focused culture that supports the achievement of organisation aims. Knowledge culture will emerge if the right cultural drivers are in place. The characteristics of a knowledge-focused organisation are numerous and often specific to an organisation but some important ones are:

(i) It is customary to share knowledge.

(ii) Staff assume others have solved problems before and automatically search for solutions before attempting to solve them from scratch.

(iii) The organisation has a pro-active attitude to learning and staff are encouraged to be responsible for their own learning.

(iv) Staff are pro-active in creating new knowledge and contributing ideas.

(v) Staff trust management to value their ideas and to reward them.

(b) **Engagement:** A challenge for many KM practitioners is to gain the interest, trust and support of staff, management and colleagues. Many people are naturally suspicious of new ways of doing things and need to be convinced of the benefits of KM before engaging in meaningful conversation or activity. Some suggestions for engagement include:

(i) Explain the KM journey (for storytelling devices see Section 3.1.1) and where the organisation is at. Clearly articulate what KM means to the organisation.

(ii) Provide case studies of how KM has been successfully applied in similar industries or in other areas of the organisation.

(iii) Address the 'What's in it for me' factor up front and include clear messages from senior management. The organisation's approach to reward and recognition systems needs to be clarified.

(iv) Involve staff: Including staff in all aspects of the design and implementation process will help to overcome resistance to change.

(v) Having identified all the internal and external stakeholders of the organisation in the risk analysis, list the benefits and impacts a proposal will have on each group. Explain how it fits in with existing processes.

(c) **Knowledge vitality:** Establish criteria by which the health of an organisation's knowledge focused culture can be measured. Where appropriate include a measure of vitality for all stakeholder groups. Suggestions for measurement criteria include:

(i) Contribution rates to and use of the knowledge system.

(ii) Adoption of new ideas and best practices; lessons learned and acted on.

(iii) Information kept up-to-date and relevant.

(iv) Ratio of time spent searching for or inputting information to time spent doing core work.

(v) Qualitative measurements of human behavioural change.

5.1.2 Cultural challenges

(a) **Identify cultural challenges:** Cultural challenges are seen as the single biggest hurdle to successfully applying knowledge management. Challenges need to be identified (during the alignment phase for projects) and addressed. There are many kinds of cultural barriers that can impact organisational objectives:

(i) Hoarding: Encouraging staff to share knowledge has traditionally been seen as the major cultural barrier to success because staff see their knowledge as a source of power which needs to be protected.

(ii) No one is interested: A common excuse for not sharing is people saying that no one would be interested in their knowledge, particularly if it is in a narrow field of expertise. However, it is the nature of knowledge that we often do not know when it will become useful.

(iii) Not invented here: Many people unconsciously dismiss the value of ideas and innovations that were not developed in-house. Some organisations have introduced a 'best copied idea' award system to encourage people to scan external environments to improve internal systems.

(iv) Reinventing the wheel: The character of many people is to never ask for help and consequently much time is spend reinventing tasks and processes. The cultural challenge is to encourage people to automatically assume problems have been solved before and to look for it via the organisation's knowledge management systems.

(v) Rigidity: Organisational routines and 'best practice' sharing programs can be useful ways of sharing knowledge but care needs to be taken to ensure they do not stifle innovation. Establish a mechanism for reviewing and challenging existing practices.

(vi) Power politics: Sharing the hard-earned knowledge resources in a department may threaten individuals and managers' sense of control. Rigid demarcation barriers between departments results in problems such as isolated silos of information. Barriers may be vertical as well with managers adhering to a 'need-to-know' attitude to organisational information, particularly in relation to strategic plans.

(vii) Resistance to change: Managers can question why things need to change when business is going well or has been done the same way for a long time. Section 1.1 characterises organisations that are succeeding in the knowledge era.

(viii) Denigration of roles: Recognition and reward of certain skill types can lead to unconscious denigration of other skill types. For example, often marketing professionals are not highly valued in engineering driven organisations and vice versa.

(ix) Future blindness: Organisations often assume the future will be much the same as the present and unconsciously filter out information that is not relevant to current activities.

(x) Leader dependency: Organisations can be overly dependent on the organisation's leadership to provide vision. When leaders do not believe staff contribute much to strategy they usually do not share knowledge of underlying factors and imperatives. This reinforces the inability of staff to make effective contributions to strategic decisions leaving leaders with incomplete information on which to base their decisions. Knowledge-centred organisations rely on the contributions of all stakeholders.

(xi) Change fatigue: Staff can find it difficult to adopt new ways of doing things if change is too frequent or too large.

(xii) Digital divide: Many people can be uncomfortable with, or inadequately trained in using computerised systems to access knowledge, and will therefore be disadvantaged.

(xiii) Technology focus: A common issue is that application of knowledge management can be dominated by technology oriented individuals.

(b) Address cultural challenges using the technologies described in 5.1.3, cultural management.

5.1.3 Cultural management

(a) **Articulate the vision:** The role knowledge management is to play in an organisation needs to be clearly articulated so that all stakeholders understand its benefits:

(i) Define KM: Because of the difficulty in satisfying all stakeholders, many organisations avoid defining KM. Organisations should develop their own customised definition and provide information on the knowledge management strategy.

(ii) Consider an address by the organisation's leadership to send an unequivocal message on the importance of KM to an organisation. Follow-up with a program of reinforcing messages direct from senior management.

(b) **Develop trust:** A win-win atmosphere of understanding, trust and ethical behaviour needs to be developed to facilitate sharing of tacit knowledge. Staff need to understand and trust the motives of management whose actions reflect their words. They must have confidence in opportunities for professional development arising from working in a dynamic knowledge-sharing environment.

(i) Organisations can develop this trust by being clear in their intentions

(ii) Management must adhere to its own policies and lead by example.

(iii) Help staff understand that sharing allows everybody to learn and grow their own capabilities, as well as sustaining organisational performance.

(c) **Management behaviour:** The behaviour of management is critical to the success of developing a knowledge-focused culture. Management needs to believe that knowledge management does actually make a difference. This belief should be conveyed to staff through all the formal and informal messages that arise through management actions, policies and personal contributions. Examples of possible management actions are:

(i) Ensure time is allocated to employees to undertake their KM responsibilities.

(ii) Ensure incentive schemes are restructured to be consistent with the organisation's knowledge management vision.

(d) **Communication:** Participation of staff in the design of the knowledge management strategies will ensure buy-in when it comes to implementation of the changes. Circumvent criticism of any KM initiative by managing people's expectations.

(i) Ensure that people who are going to be affected by change participate in the design of any solutions. The different ways people share knowledge should be identified and catered for.

(ii) Use processes that allow participants to reach a common understanding of each other's concerns.

(iii) Provide support: Nominate staff with good people skills in each business unit to assist with the introduction of KM and foster positive opinion. These people (known as opinion leaders) should fully understand how the organisation is using KM and be able to answer questions and provide immediate support to other staff.

(iv) Outline a realistic timeframe for reaching important milestones and differentiate between easy wins and the deeper cultural changes signifying real progress.

(v) Define expected outcomes: All staff need tangible outcomes to work towards so they can see the benefit of their activities.

(vi) Provide feedback: Staff need to see what is being achieved by the KM program and that their suggestions are being acted on.

(e) **Incentives:** Employees need an incentive to contribute to the organisation’s knowledge base or share knowledge with colleagues. Rewards for sharing can take many forms — including financial.

(i) Recognise the importance of personal recognition that reinforces a person's reputation.

(ii) Identify, value and reward individuals who have an innate desire to share — whether it is their nature or their enthusiasm for a subject.

(iii) People will often share in the expectation of future return favours. Explore ways of using this expectation to encourage sharing.

(iv) Account for the importance of job satisfaction and support natural desires to do jobs well. Include rewards for participation in peer reviews (or other quality control measures) of other people's contributions.

(v) Ensure that knowledge management metrics are included in a person's key performance indicators during their performance appraisals. Balance rewards for knowledge contributions with other key performance indicators.

(vi) Balance the value of team-based, organisation-wide and community-based rewards with individual rewards.

(f) **Build into normal activities:** KM is less likely to work if people perceive it as an additional task or program that they must participate in. Ensure that KM tasks are built into normal activities and that KM is not viewed as a separate program:

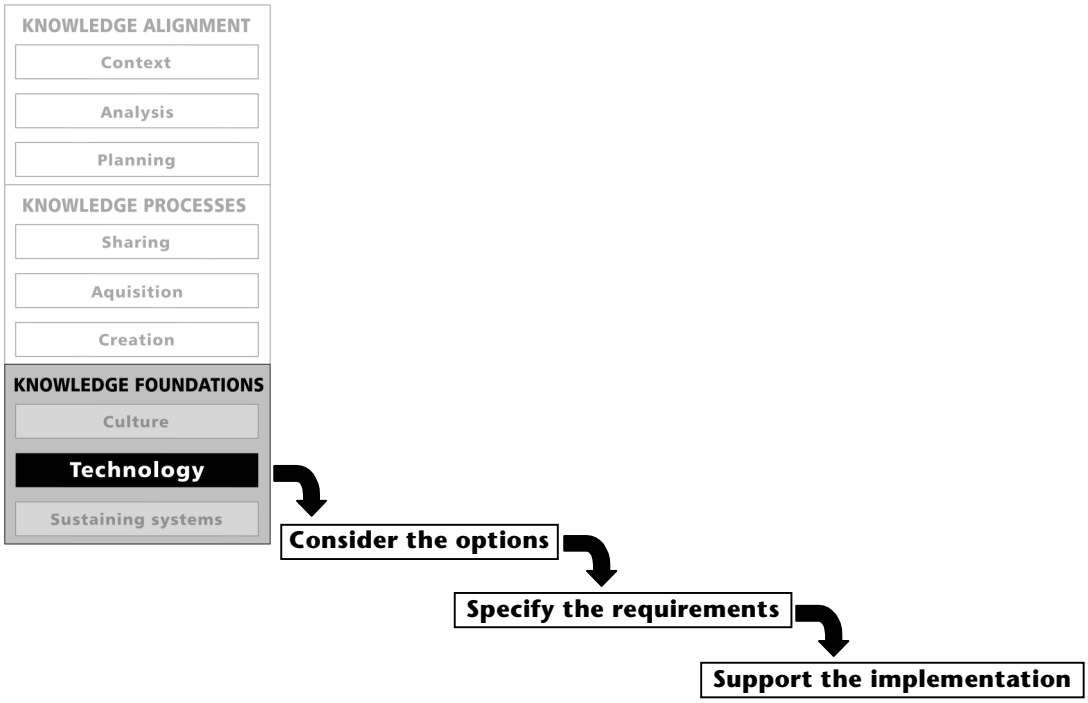
(i) Orient change around systems and processes: Most changes result from implementation of new organisational systems or processes.

Focus on what will make these work and the barriers to their successful implementation.

(g) **Change management:** The change management plan (discussed in 3.3.1) should address cultural challenges on an ongoing basis. As an organisation adapts to the requirements of being knowledge focused, new cultural challenges will be continually uncovered. So knowledge management involves more than just dealing with current and obvious challenges. It must continually monitor and address the new challenges as they arise.

5.2 Technology

Knowledge processes required to achieve organisational objectives can be supported by a range of technologies. This section sets out the considerations that should be accounted for when specifying and implementing technology.



5.2.1 Technical considerations

(a) **Exploring the options:** The 'best' technology platform will always be unique to each organisation and the processes within the organisation. A short list of technologies that are relevant to KM are described in Appendix A.

(b) **Information management:** Consider splitting information management responsibilities from technology management. This allows a stronger emphasis on delivering systems that meet the organisational needs.

(c) **Simplicity:** The overriding factor in tool selection is that it must be very easy for staff to contribute knowledge and preferably as part of their normal working procedures. If KM tasks are seen as an extra activity separate from normal routine they may be viewed as an extra burden:

(i) Wherever possible routine tasks should be automated.

(ii) Standardise documentation procedures.

(iii) Provide templates for structuring, styling and automatic insertion of metadata.

(iv) Provide tools to assist knowledge creation techniques such as mind mapping software.

(v) Provide authors with the ability to publish to web sites (internal and external) without needing to pass via another person except for approval/security reasons. The process should use templates

that allow authors to publish information without consideration of the graphical presentation.

(vi) Accessibility: Ensure that staff can access the systems used. Where computer access is not universally available, consider the use of kiosks and provide appropriate training.

(d) **Integration:** The practicalities demanded to integrate legacy data and the variety of KM approaches mean that organisations generally may not implement a single integrated approach. The following points need to be considered in the context of overall organisational needs.

(i) The extent to which particular technologies are integrated with other technologies and organisational systems will depend on cost/benefit studies in the alignment phase.

(ii) Repositories should be implemented so that they are accessible to other systems or at least provide easy or automated downloads of information when it is required by other systems.

(iii) Where possible the records structure should be organised so that all information about a single entity (such as a customer or a topic) can be discovered by a single interface.

5.2.2 Specify the requirements

(a) **Specifications:** The specifications for technology should be developed only after the requirements of all other elements of knowledge management strategy have been identified. In other words, an organisation should not choose a technology because it is easily available and then implement practices that can make use of it. This runs the risk of misaligning knowledge processes with organisational objectives.

(i) A first step should be to determine if the technical needs can be met by better use of existing technology.

(ii) Determine the available budget and take this into account when ordering the specifications by priority.

(iii) Staff involvement: When selecting key users to help specify systems it is important to involve leading edge users who can visualise future uses of the system. This must be balanced by practical users who are likely to understand how the majority will react to the system when it is first installed. Consider the use of prototypes or examples of similar systems to elicit user feedback.

(iv) Develop a KM suite: One approach to technology is to integrate all content so that it can be re-used for multiple purposes. Another approach is to buy best-of-breed software that best suits the immediate task at hand. Develop a suite of technologies rather than choosing a single approach.

(v) Multi-channel delivery: Avoid a single channel technology approach to reaching people. Conduct a segmentation analysis of the target audience and if necessary and justified, pursue a multi-channel approach that corresponds to a range of profiles.

(vi) Balance the KM requirements and technical limitations: In specifying the systems be aware of the technical limitations such as the load imposed on the network and any organisational policies.

5.2.3 Support the implementation

(a) **Provide training:** Identify key people in the organisation who can train others in using the new technology. With staff doing the training, the impression that the technology is being imposed from on high is avoided. This training should take place before, during and after the technology is introduced. This should be supplemented with computer literacy training for staff who need it.

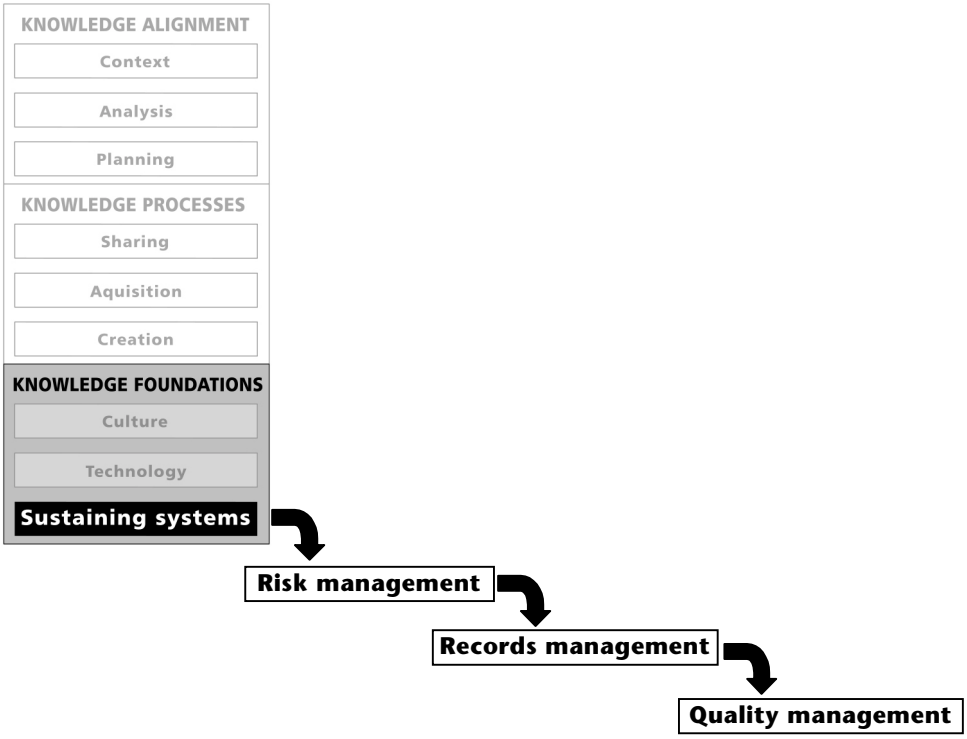
(b) **Provide support:** Organisations must provide support for their staff before, during and after the implementation of the technology. The extent to which this support is automated with context sensitive help or simply by telephone support will be justified by the application and its alignment to organisational aims.

(c) **Use immediately:** Ensure that a real project using the technology is waiting for staff when they return to normal work activities. Familiarity with systems is quickly lost if it is not used.

(d) **Evaluate the technology:** The technology needs to be continually evaluated after it has been implemented to ensure that it is meeting the organisation's KM needs.

5.3 Sustaining systems

Knowledge management initiatives should be integrated with other managerial systems to ensure that they are implemented in a sustainable manner. Key managerial systems are set out in this section with explanations of how they can support knowledge processes.



5.3.1 Risk Management

(a) **Introduction:** Knowledge management complements other management tools and as such, benefits can be gained by integrating with them. Risk management, records management and quality management are three major organisational systems that can help ensure KM is implemented in a sustainable manner. Organisations should also identify other systems in their organisation that should be integrated.

(b) **Risk management** is the term applied to a logical and systematic method of identifying, analysing, evaluating, treating, monitoring and communicating risks associated with any activity, function or process in a way that will enable organisations to minimise losses and maximise opportunities. It consists of an iterative process with steps, which, when undertaken in sequence, enable continual improvement in decision-making. In the context of KM, it can be applied to ensure that any knowledge management activities are addressing real needs of the organisation. An important objective of the risk management approach to setting priorities is to encourage the risk awareness at all levels of the organisation so that it becomes a cultural norm to continually identify new risks and address these appropriately. See Section 3.2.1 and Appendix C for more detail. The Risk management standard AS/NZS 4360:1999 is available at www.standards.com.au

5.3.2 Records Management

(a) **Introduction:** Records management provides for systematic control over the creation, handling, processing, filing, storage, retrieval and disposal of records. In the context of knowledge management, a record can refer to any form of explicit knowledge. Many organisations already have records management systems in place for other purposes and these should be examined to determine the benefits of integrating them with knowledge management systems. The Records management standard AS 4390-1996 is available at www.standards.com.au.

(b) **Standards in record management:** AS 4390-1996 describes methods for any organisation that needs to control and manage its records to meet business, legal, fiscal and quality systems requirements. The standard covers both manual and computerised records management systems and specifies how an organisation should implement such a system. AS 4390 also provides a basis for measurement of the effectiveness of records management systems and programs.

(c) **Records management and KM:** Throughout this KM Framework, reference is made to records management. Where organisational knowledge resides in explicit information the principles of records management should be employed in its management.

(d) **Risk management and records:** Risk management assessments need to be documented and managed. Not keeping track of proposed actions is itself a risk.

5.3.3 Quality Management

(a) **Quality management** can be used to ensure that the KM processes and procedures are carried out consistently as intended. The 2000 edition of ISO 9000 has embraced the process approach which complements this KM Framework in ensuring that any KM activities are focused on delivering value to all stakeholders in an organisation, including customers. The quality management standard AS/NZS ISO 9000:2000 is available at www.standards.com.au.

5.3.4 Other systems

There are a wide range of management systems and standards that complement this Framework and they are listed in more detail on our KM portal at www.knowledge.standards.com.au. For example, consider the following:

(a) Information security

(b) Compliance programs

(c) Documentation standards

(d) Business-to-business information exchange

(e) Outsourcing management

(f) Complaints handling

Appendix A Technology

(a) **Introduction:** Knowledge management systems can not be implemented using technology alone. Indeed KM can be implemented using no technology at all. However, in most circumstances technology is an enabler that supports the sharing of knowledge.

(b) **Technology briefs:** The number of technologies that are useful for knowledge management are too many and varied to list here. Brief introductions to some common technologies follow, and a more comprehensive list is available at www.knowledge.standards.com.au .

(i) Retrieval engines: Commonly known as search engines, this technology allows a user to search content and metadata to retrieve information. Search engines employ a variety of techniques to rank the results. Generally speaking, the more structured the original content the better the results.

(ii) Content management: Content management refers to systems that store information so that the content is logically separated from its presentation. Documents are typically structured into component parts or the text can be 'marked up' to assign meaning to the individual words and paragraphs. See Section 5.2.1 for more detail.

(iii) Document and records management: Document management systems make use of metadata attached to the content. The metadata facilitates features such as version control and workflow. Workflow systems allow documents to be automatically passed from one person or system to another ensuring all tasks on the document are completed.

(iv) Learning systems: Learning systems include web-based courses, computer-based training (CD-ROM etc), virtual classrooms, program assistants and many more. Learning systems create multiple delivery options and introduce cost savings as learner numbers increase.

(v) Automatic classification systems: There are a range of technologies sometimes known as pattern recognition, neural network systems, linguistic or semantic processing and others. The main feature of all of these is that they facilitate automatic classification systems through the identification of 'concepts' derived by identifying patterns of words. Generally speaking these systems are trained with sample documents. They are able to scan large volumes of text, identify concepts and apply metadata without the need for human checks. This facilitates automatic link generation to 'similar' documents, push systems, fielded search systems and more.

(vi) Other intelligent technologies: There are wide range of other technologies that can be included in the knowledge management

arena. They include artificial intelligence, regression and correction, case-based reasoning, expert systems, data and text mining and rules-based systems.

(vii) Archiving: Taking into account records management requirements and storage limitations, organisations should consider a long-term storage strategy for information storage.

(viii) Other technologies: More technology summaries are available on our KM portal at www.knowledge.standards.com.au.

(c) **New technologies:** Interested parties may email technology white papers for consideration to be included in the technology appendix hosted on the KM portal. Explanations of the application of technology in knowledge management made without reference to any organisation, association or product name will be considered for inclusion in the list. White papers may be emailed to Standards Professional Services following the instructions on the KM portal.

Appendix B Government policies & guidelines

(a) **Introduction:** This section examines requirements mandated by government policy. It is designed to ensure that government employees consider the content of this Framework in the context of a government's existing policies. All of the knowledge management elements outlined this framework can be applied in government. This appendix provides additional information that government employees should consider.

(b) **The government context:** Government organisations tend to have well-developed strategic planning processes. They should capitalise on these strengths by correlating knowledge with policies and strategies. This will help deepen management appreciation of KM and create a strategic framework for priority setting and implementing KM across the organisation.

(c) **Guidelines and policies:** Government employees and organisations are often required to adhere to regulations and policies that impact on the knowledge management activities. A short list of these are outlined as follows:

(i) Information sharing standards: Often governments have an information sharing policy and networks in place already that allows inter-departmental access to information (often via whole-of-government intranets or search engines). KM systems should be compatible with these.

(ii) Procurement: Governments often negotiate whole-of-government procurement agreements with technology vendors or pre-approve a short list.

(iii) Directories: Government often have electronically enabled directories. Any directories created as a result of knowledge mapping should be compatible with these.

(iv) Records management: Most governments have legal requirements or policies relating to records management and guidelines which explain how to implement records management. For example, in most governments it is illegal to dispose of records without appropriate disposal approval.

(v) Metadata standards: Many governments have metadata guidelines designed to assist the discoverability of information.

(vi) Spatial information: Information that is geographical in nature should adhere to the state guidelines to ensure compatibility with other systems.

(vii) Privacy: The privacy rights of all citizens needs to be protected by retaining the confidentiality of personal information and ensuring that government privacy policies are adhered to. This is often tied in with information security regulations.

(viii) Liability: Any organisation can be liable for information given to the public. Guidelines are often developed to manage the risk of exposing the government to liability in information released to the public via verbal advice or otherwise published. Any systems put in place should be integrated with records management systems to ensure that the processes by which knowledge resources were established can be traced and defended.

(ix) Public rights and information quality: Government organisations have a responsibility to ensure that information they supply is correct and facilitates the public's right to information. Most governments have publishing guidelines including best practice web publishing and quality of information standards.

(x) Intellectual property valuation: In developing knowledge-based products determine whether they will be made available to the public or other government organisations and adhere to any access and pricing policy.

(xi) Knowledge management: Many governments have developed or are in the process of developing whole-of-government knowledge management policies and guidelines.

(d) **Special projects:** Governments often sponsor special projects or KM related initiatives such as:

(i) Steering committees: Governments are appointing steering committees to determine knowledge management strategies. Ensure people are made aware of these groups and are included in any communication strategies.

(ii) KM forums: Knowledge managers from different departments usually band together to share ideas. Find out how to join.

(iii) Departmental projects: KM is often implemented on a departmental basis. Discover what other departments are doing in KM and what you can learn from them.

(iv) Communities of interest: Governments are leading the way in fostering communities of interest directly or indirectly related to KM.

(e) **KM portal:** Information on the specific policies of regional governments can be found at www.knowledge.standards.com.au. Representatives of governments already listed there may submit information to update or extend information listed. Brief descriptions may be emailed to Standards Professional Services. Include links to more detailed information resources and the contact details of the submitter for verification. A template is available to facilitate creation of new government sections on the KM portal.

Appendix C Risk Management

(a) **Risk and opportunity management:** Risk management is a rigorous methodology that can be used to establish organisational priorities. The following paragraphs paraphrase the Risk Management Standard from a knowledge management perspective (see Figure 3 in Section 3.2.2).

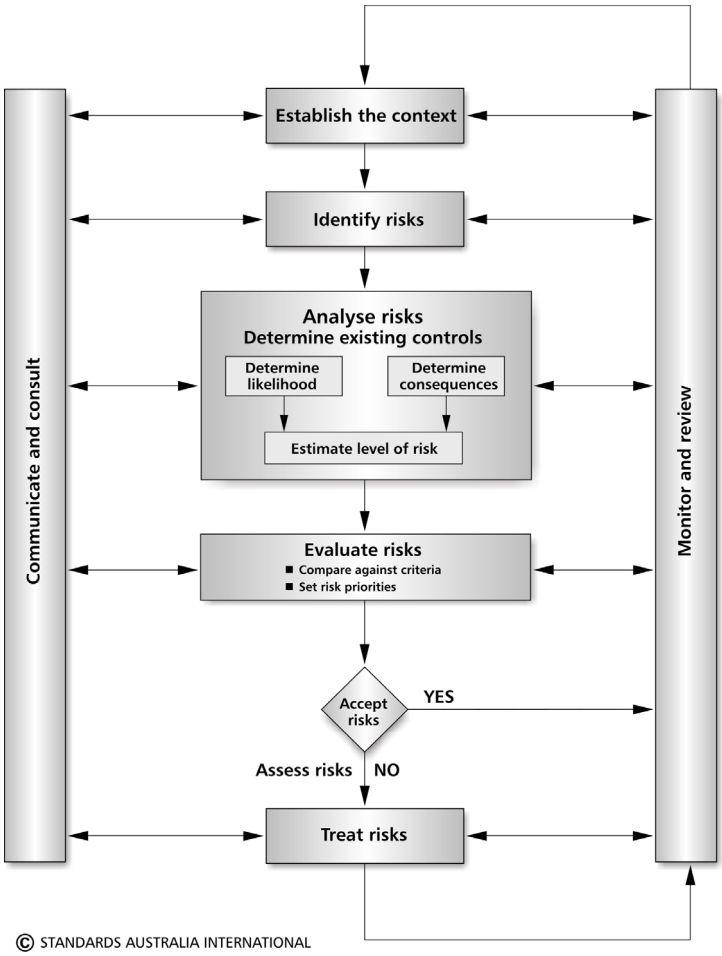


Figure 5 — Risk Management (reproduced from AS/NZS 4360:1999)

(b) **Establish the context:** The first step of the risk assessment process is to define the entity that is being examined and establish a structure for evaluating risks and opportunities. The structure separates the contextual framework into a set of elements that can be used for a systematic examination of the organisation, ensuring no major risks or opportunities are overlooked. The structure chosen will depend on what is being examined but should take into account the broad context established in Section 3.1.

(i) Establish the criteria by which risks and opportunities will be evaluated and measured. Financial criteria are not the only measure. Compliance with legal requirements, operational and technical objectives and social measures are just some of the criteria by which the effectiveness of an initiative can be measured. More than one set of criteria can be chosen.

(c) **Identify the opportunities and risks:** Identify a list of possible events relating to the structure identified in the previous paragraph. Examine the root causes and scenarios in which the above events may occur.

(i) It is easy to focus on negative risks. Include opportunities like winning major contracts, major social events, positive environmental outcomes, identification of new technologies that improve services etc.

(d) **Risk analysis:** Determine the likelihood and consequences of events occurring. Decide on the depth of analysis ranging from qualitative to quantitative analysis. Identify any existing controls. Estimate the level of risk and opportunity.

(e) **Risk evaluation:** Compare estimated levels of risk against the criteria established in Section 3.1. This enables risks to be ranked so as to identify management priorities. If the levels of risk established are low then risk may fall into an acceptable category and knowledge management activities to treat the risk may not be required.

(f) **Treatment of risks:** Organisations can either avoid or retain the risk. Opportunities may be lost by an undue emphasis on risk avoidance. Treatment options include:

(i) Reduce the likelihood of a negative risk or enhance the likelihood of a positive event. Determine what knowledge processes can assist in this.

(ii) Reduce the consequences of a negative event or enhance the benefits gained from a positive event. Determine what knowledge processes can assist in this.

(iii) Transfer the risk: Some or all of the risk can be transferred through insurance, contracts or some other mechanism.

(g) **Monitoring and review/Communication and consultation:** Revisit the risks on a regular basis to ensure that any changes to the risk profile are identified and acted on. Regular communication with all stakeholders will ensure that decisions made are taking proper account of key risks and opportunities.

Appendix D Acknowledgements

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