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WHITE PAPER



Commercialising Know-How

Processes to extract value from public
sector intellectual capital

October 2009

Version 1.0



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1.0 SCOPE OF THE GUIDELINES

The guide aims to enable public sector agencies to extract maximum value from investment in research and skills development through better utilization, exploitation, packaging and consequent pricing/valuing of their intellectual capital – in particular their “know-how” (ie non-patentable intellectual property). In order to do this it defines key elements of intellectual capital and outlines methods of valuation and processes for exploitation.

A key component in the utilisation and exploitation of intellectual capital is the management of intangible assets, such as personnel, intellectual property, organisational systems and relationships.

The process framework provided in this guide is designed to assist agencies in identifying, “capturing” and realizing value from their intellectual capital. ‘Value’ in this context should be distinguished and kept separate from income generation, in that the “value” derived from those intellectual capital assets is not synonymous with any potential income generation. Strategic direction or core functions of agencies may prevent them from charging market rates for services associated with accumulated intellectual capital. Alternatively return on investment on the output generated by utilization of intellectual capital may occur in the form of improved industry productivity and growth in GDP/GSP rather than as direct income stream to organisation.

A key element of the utilization process is the valuation of intellectual capital. Valuation in terms of this paper, has an element of subjectivity that will be dependent on the aim of the organisation, intended application and outcomes from investment, industry sector and a number of other situation specific variables. The guide identifies the variables to be considered and provides information on where further valuation assistance can be obtained. The information outlined in this paper provides a discussion outline of the systems and procedures required to extract the best value from intellectual capital. These processes have been based on the issues raised through broad stakeholder consultation, particularly in public sector agencies – in relation to the management and utilization of the “know how” of their people.

Implementation of any specific processes as an outcome from this document will generally vary from agency to agency due to the level of sophistication of existing decision support systems and the requirements of agency structure and aims. Step by step implementation guides will be developed as a further outcome of this paper.

2.0 INTRODUCTION TO INTELLECTUAL CAPITAL

Any process or guide to define any value relating to know-how and intellectual capital requires definition and this section determines the components of intellectual capital, what ownership and control rights the organisation has over these components, and how intellectual capital adds value to the organisation.

2.1 What is Intellectual Capital?

Intellectual capital¹ is the collective term used to describe the resources of an organisation that are not physical assets or cash and are intangible. This is a broad area that encompasses a wide range of different assets and processes including:

- Skills and competencies of the workforce (ie management expertise, technical knowledge, know-how)
- legal or contractual property rights (ie patents, trademarks, designs, leases and licences)
- organisational processes (ie information systems, networks, administrative structures and processes, market and technical knowledge, brands, trade secrets, internally generated software, drawings).

It has been estimated that 80% of corporate wealth in international developed economies is represented by intangible intellectual capital assets.² Such estimates should encourage organisations to incorporate intellectual capital management into a comprehensive business management strategy rather than merely act as a set of tools.

There are a number of ways of categorising these intellectual capital resources. However for the purposes of this guide, a consistent definition is based on Chart 1 below.

¹ Zambon 2003, Rylander, Svieby, McPherson and Pike

² Nermien (2003) "Comprehensive Intellectual Capital Management Step-by-step" reviewed in les Nouvelles Sept 2003 p. 157.

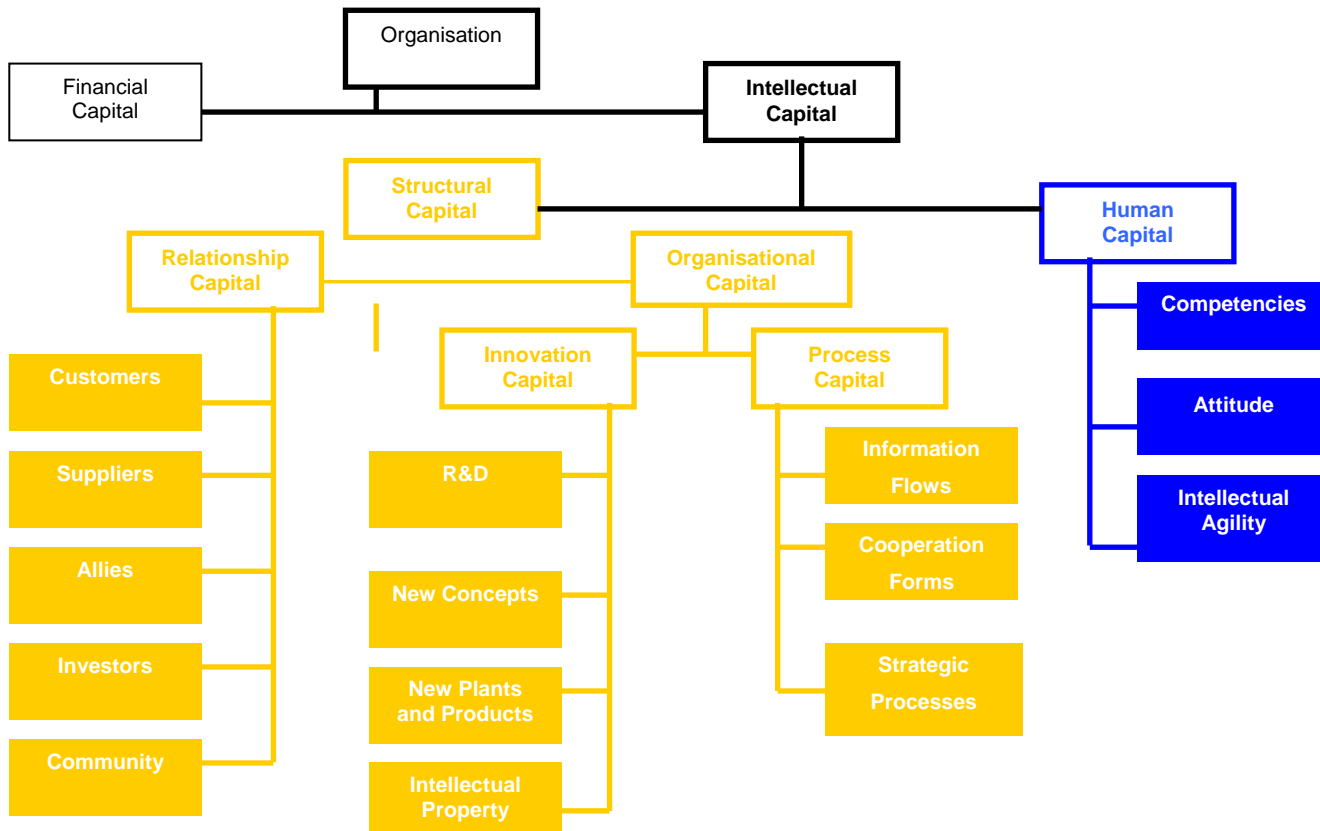


Chart 1: Components of Organisational Intellectual Capital

This classification differs from any accounting treatment which demands that the ‘*intangibles*’ comprising intellectual capital be treated as expenses or assets and depreciated in the balance sheet over time. This distorts the valuation process organisations need to undertake in order to determine both the worth of these activities to their organisation and the potential for exploitation.

For the purposes of this framework, intellectual capital is divided into Human Capital and Structural Capital³.

Human Capital is the organisation’s workforce and their associated skills.

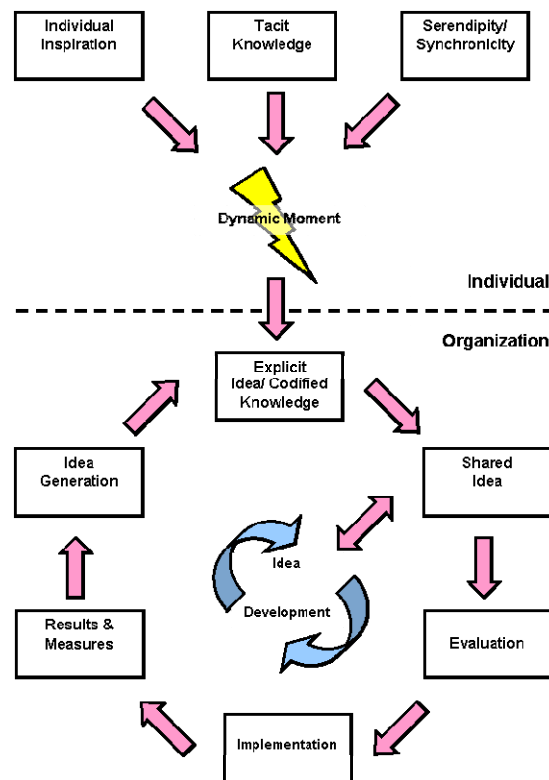
Exploitation of this element of intellectual capital is heavily reliant on culture and human resource management practices. Research has demonstrated that human capital is the source of innovation and strategic renewal for organisations (see Figure 24). Its contribution to the organisation is based in the intelligence and the tacit knowledge (know how) of the

³ Roos, Sveiby, Edvison

⁴ Provided by J. Kapeleris (2004) PhD thesis University of Queensland;

individuals who work in the organisation. This is notoriously difficult to capture and manage as it is dependent on culture and human resources management systems. There is some debate as to which systems are better for allowing the appropriation of intellectual capital – the resource based theory of the firm most popular.

Figure 2: Dynamic source of interaction and innovation between individuals and organisations.



These resources can be further divided into:

- ➔ competencies, including skills and know-how;
- ➔ attitude, including motivation and social abilities and leadership qualities of the top management;
- ➔ intellectual agility, including innovation and entrepreneurship and the ability to adapt⁵.

Traditionally investment in human capital has been perceived as an expense rather than an investment in value creation.

⁵ Sveiby 1998

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This perspective needs to change to the recognition of intellectual capital being as a key strategic asset if organisations are to fully exploit their potential. For example, studies have demonstrated that the return on investment on training has the potential to be as high as 200% if staff retention rates are high⁶.

Stakeholder organisation, in particular, public sector agencies are aware of the value of their human capital and are seeking ways to extract more value from the 'know-how' of their employees. The issue for the majority of stakeholders is that they do not have the information required to

- a) enable them to identify the individual components of their IC assets, or
- b) determine additional use or potential return on investment relating to their human capital.

Human resource management systems are constructed to hold information on salaries and entitlements, while project based systems have a tendency to be qualification based or only utilized for the term of the project.⁷

For organisations to exploit the 'know-how' of their employees systems to identify and record capabilities and competencies are required and need to be introduced if they do not already exist.

Structural Capital can be further broken down into **organisational capital** and **relationship capital**.

- **Organisational capital** deals with internally generated "intangible assets"
- **Relationship capital** deals with the value that is created through interaction with external parties.

As the components of structural capital have a strong correlation with the accounting standards definition of "intangible assets" and with disclosure and compliance requirements for ASIC – the reporting frameworks and decision systems of most organisations are better developed than those for human capital. Therefore the identification of those resources is easier than that for human capital.

⁶ Zambon 2003 pp

⁷ Consultation with public sector agencies, Zambon 2003, Hunter 2002

Organisational capital is further broken down into **innovation capital** and **process capital**.

Innovation capital is the organisation's capacity to innovate by creation of new products and services and intellectual property with structured property rights recognized under international law is the most defined area of innovation capital.

Under Australian Law Intellectual Property includes:

- Patents: standard and innovation
- Copyright
- plant breeders rights
- registered designs
- circuit layouts
- trademarks
- confidential information

Process capital is the soft infrastructure the organisation uses to create output.

It includes

- management structure
- organisational routines
- computer systems
- information collection and processing systems
- communication mechanisms
- management structure
- filing systems and accounts management systems.

This element of intellectual capital is vital to the extraction of value from all other elements of intellectual capital as the processes within an organisation govern the utilization of its workforce, assets and relationships.

This techniques in this guide focus most on the process capital component of Organisational capital. The combination of process and human capital is the basis of most non-patentable IP, particularly that designated as know-how.

Illustrations of this combination include the results of research programs or policy development that can be patented (e.g. through a Business Process Patent) or otherwise protected (e.g. through scheme of accreditation and qualification of users) to improve value determination and generation for agencies seeking to commercialise them.

Relationship Capital is the organisation's relationship with external parties that are core to the delivery of the strategic aims of the organisation. These may be suppliers, customers or an extended network of stakeholders. For many public sector agencies, for example, the relationships with their stakeholder communities are of immense value. However due to the nature of the relationship with their stakeholders and their core functions public sector agencies often overlook the inherent value of these relationships, particularly with their ability to impose a barrier to market entry for other parties or alternately remove any barriers to entry.

2.2 Ownership and Control of Intellectual Capital

Ownership and control is a vital element of being able to exploit assets. If an organisation cannot demonstrate control over its intellectual capital it will not be able to extract the full value from those assets⁸.

Organisation capital is the only component of intellectual capital that an organisation has complete ownership and control over. Of this, formal intellectual property falls into this category and it has quite clear property rights associated with it which allow protection and exploitation to occur.

In contrast "know-how", with its reliance on human capital and the process capital element of an organization, is embedded in either

- ➔ the individual employees of an organisation and consequently largely controlled by the workforce or
- ➔ the processes which are difficult to formally protect for exclusive use as while having value do not necessarily meet the guidelines for formal IP protection or are not worth the cost of that protection.

It is therefore more difficult for an organisation to protect and exploit that know-how than any other form of IP although the organisation can gain the benefits of its workforce output.

⁸ Al-Ali-(2003)

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It is this difficulty controlling and owning know-how which most agencies identified as the key barrier to extracting value from its intellectual capital. Without adequate resources dedicated to the task, knowledge held by any workforce cannot be completely captured and consequently is unlikely to be identified, protected or efficiently used.

Research has demonstrated that in spite of commercial protection and imperatives private firms lose one third of their R&D effort to “spillover” social benefits. As R&D represents only a small portion of total sources of new knowledge the potential “spillover” from the remaining components of IC (know-how and processes etc) is substantially higher⁹. The spillover of knowledge (and its associated benefits) involves the transfer of knowledge to external parties and is a direct result of the difficulty exerting control over the basic elements (know-how and processes etc) of intellectual capital. Control and ownership are necessary pre-requisites for exploitation of these intangibles, and while they are not the only pre-requisites, they represent a major issue facing public sector agencies which particularly wish to maximize the value generating potential from the IC resources¹⁰.

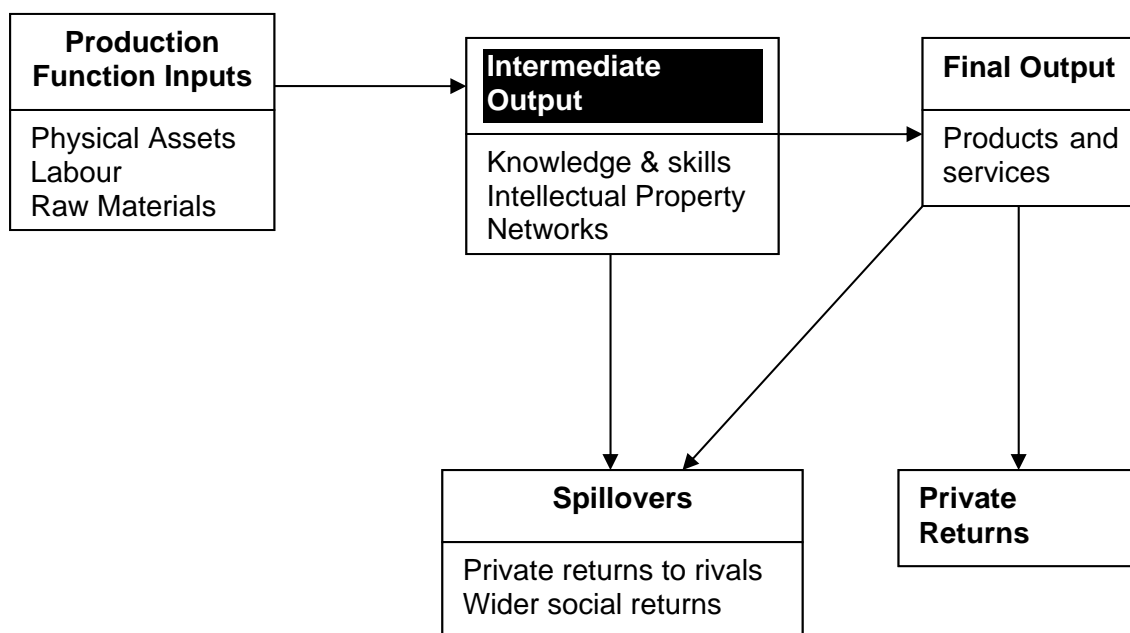


Figure:. 3 Knowledge Spillovers

⁹ Zambon 2003 pp 36-43

¹⁰ Hunter 2002

Figure 3 represents the source of spillovers which can result in additional returns to private competitors through either the reduction of barriers to entry into specific markets (eg learning experiences, redesigning of existing and competing products) or the imposition of barriers to entry, by creating monopolistic market systems (e.g. electricity, telcos etc) which provide wider social benefits. New products and services going into the private sector (through either the creation of new companies, or through licensing of R&D outcomes to established companies) provides a competitive advantage to those companies and these advantages need to be evaluated appropriately.¹¹

The situation is further complicated for public sector agencies in particular, by the fact that their strategic aims involve the achievement of wider social returns. This means that many of their systems for product and service delivery are designed to maximise the knowledge spillover from investment in research and development and training /knowledge of their personnel. Thus agencies attempting to exploit their intellectual capital have a higher degree of difficulty and risk than their private sector counterparts when attempting to generate income from the exploitation of their intellectual capital, due to private sector perceptions that public sector agencies could effectively be increasing the level of competition in individual markets.

This is not an insurmountable difficulty for public sector agencies, and two actions can be adopted to address this issue.

Firstly, there is the need to recognize that income generation is not the only measure of value.

Secondly, treating all intellectual capital based projects as if they were designed to derive private sector returns.

These two actions mean implementing processes which will be dealt with in the next section but which briefly comprise:

- ➔ The integration of existing business management systems to ensure that organization wide intellectual capital is identified and use of these resources can be optimized. This includes secondary intellectual capital that may be a side effect of the process or project.

¹¹ Wyatt 2003, Wyatt & Wong 2002, Webster 2002, Zambon 2003

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- Specifically identifying the outputs/outcomes of projects and defining these results as potential products or services regardless of pricing strategy intended. This sets up boundaries for the public good elements of programs, thus providing clarity which can allow secondary uses of technology, skills or services to be readily identified and separated out.
- Treating the target group of the policy, project as a market with needs to be met and having processes in place to identify other potential markets for secondary uses of the intellectual capital created.

The benefit of this approach is that a single standardised management procedure can then be used for all agency projects regardless of whether their end purpose is wider social returns or income generation. The process for core functions will then be able to be implemented for additional income generating activities without draining resource from key functional areas.

The key point of difference is in the application of an appropriate (e)valuation and consequent pricing strategy.

This approach will provide the agency with

- the information required to enable it to determine whether a project has the potential for private returns as well as the required public good functions.
- the ability to deliver the social returns/public good elements of the project in a way which maximizes potential future income generation from alternative applications.
- The solution for public sector agencies to incorporate practices with complementary goals of public good and income generation outcomes from their intellectual capital as opposed to promoting competing goals.

3.0 MANAGING INTELLECTUAL CAPITAL

This section offers a staged implementation process which can be embedded in organisational planning to address the issues faced by public sector agencies seeking to ensure maximisation of returns from their intellectual capital.

3.1 Overview – Issues and Challenges for the Public Sector

As previously mentioned, public sector agencies, through consultation, have outlined a number of key issues which they consider hinder the best use of their intellectual capital resources¹². These include:

- i) Lack of skilled and dedicated resources to co-ordinate the management of intellectual capital – resulting in lost opportunities for value creation/exploitation ;
- ii) Lack of information on skills and competencies of personnel – decreasing efficiency of project delivery and ability to identify and correctly manage “know-how”;
- iii) Lack of consistent processes and policies for intellectual capital management embedded in agency business cycles – leading to i) and ii);
- iv) Lack of valuation skills – pricing of project outputs is treated as a generic agency function instead of being based on valuation of the activity under consideration – leads to less than optimal project outcomes and incorrect valuation which may increase income generation at expense of longer term value generation;
- v) Difficulty in identifying boundaries of “public good” requirements – complicates the task of choosing appropriate delivery mechanism and valuation of product/service
- vi) Conflicting objectives demanded by core business and requirement to generate income.

As a result of these issues many agencies consider they are not in a position to optimise the use of that intellectual capital. However research and overseas experience indicates that knowledge and understanding of the opportunities to further leverage IC assets and the focus on process rather than harnessing the inherent know-how to produce and apply

¹² Consultation

outcomes presents a significant barrier to optimising value and any potential returns¹³. This can be expressed in terms of the cultural differences between the perception of the *raison d'être* for creating know-how and process activities ie “we are doing this to ---” and the alternate view “in order to do this, we need to do ---”.

3.2 Exploitation of Intellectual Capital

There are five main elements to a system for exploitation of intellectual capital:

- Intellectual Capital Assets used to develop products and services
- Combination of these assets to produce products/services
- Internal benefits arising from the combination of these assets
- Acceptance of these combinations as product/services by target “markets”
- Capture of the external value generated from the product or service
- Identify the value of benefits produced by the combination of these assets

This system can be designed for an agency level, sub-unit level or program/project level.

Figure 4 provides an illustration of the conversion of intellectual capital assets into the desired outcomes through meeting the needs of identified markets and treatment of the results as products. In a public sector environment the outcomes required to meet the objectives of the government, policy or organisation may be wider economic or social returns rather than income generation.

In order to meet its objectives the organisation combines its resources to produce the results required to service client need. Regardless of whether the objectives of the organisation are income generation the creation of products creates two results, meeting of client need and the increase in the intellectual assets held by organisation.

¹³ Thorelli (1986); Ternouth (2003) personal communication;

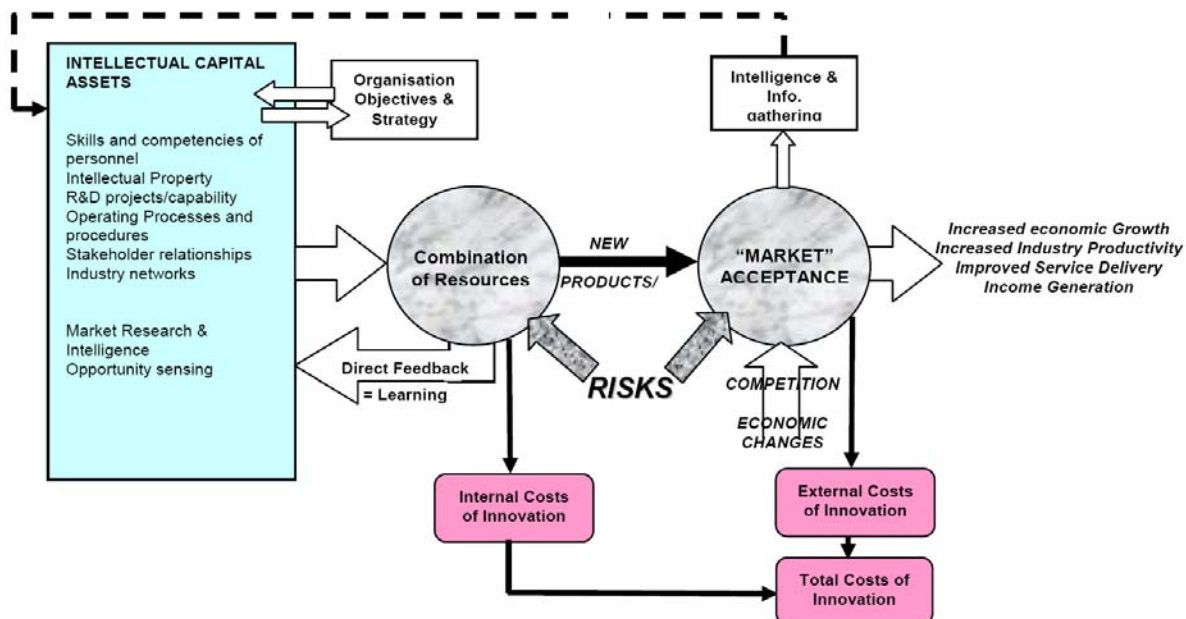


Figure 4: Exploitation of Intellectual Capital© Philip M'Pherson 2004

For organisations, the most difficult elements in this process are to master the combination of the appropriate resources to developing a product offering and “defining” the path to “market” for this offering. The risks at each stage are different. The risk at the combination phase is a technical or feasibility based risk, can the desired output be created and made to function as required. The second risk lies in the acceptance of the output by the target market as meeting its needs.

In the case of public sector agencies “marketing” may be defined as “the satisfaction of a user need by means of an exchange process” where a “market” can be defined in terms of an industry sector or given group of stakeholders with similar needs/opportunities. The aim is not necessarily income generation, but rather the adoption of new practices to improve economic growth or social outcomes.

A difficulty for many agencies in determining “value for money” is that the cost of the intellectual capital creation (new product/process or service) can be easily identified but the return cannot, as in many cases the project falls within core business and thus cannot be charged for or converted into monetary terms.

An illustration of this would be in the field of primary industries where significant resources are invested in development of new practices that will increase yield with the ultimate aim of increasing economic growth and productivity.

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The issues faced by agencies involved in this field are first the research and development required to make the desired outcome (e.g. pest resistance bananas) feasible.

The second issue is obtaining support from the “market” to adopt the practice. The cost of the investment is to be set against returns on overall production increases rather than on income generation. Fee for service may discourage adoption.

Given that many of the services are deemed “public good” and to be provided free of charge – there has been no encouragement for public sector agencies to invest the resources required to undertake the formal process of costing and bundling and pricing of any goods and services.

This reinforces the perception that all goods produced in this way should be “free of charge” is “at no cost to the receiver”. The inability to define the boundaries of the services that are public good makes the identification of secondary uses beyond the scope of the project or in other markets or industries more difficult. The end result being an inability to justify where alternate funding sources are required and make appropriate decisions on whether the income from fee for service will outweigh the benefits.

If the public sector is to ensure that it exploits its intellectual capital, particularly the “know-how” elements it needs to ask that question and determine the “value” of all goods and services. It must therefore capture the internal costs and returns of the process of improving intellectual capital and the value of improving staff competencies and developing large active stakeholder networks. However, it also needs to consider the pricing of that determined value with a view to determining what the respective market is prepared to pay, rather than merely (re)capturing the cost of development.¹⁴

It is only through carrying out this process that an agency can determine if potential benefits (both public good and economic returns) justify the development cost for that intellectual capital. This is particularly true of those services that intended to be provided free of charge to users (although it must be acknowledged that somewhere, someone pays, it is more a question of who pays). It is especially important for these items to be then priced with the value proposition equation undertaken in terms of potential revenue foregone to service the public good function. This revenue foregone can then be added to calculations of value

¹⁴ Hunter 2002, Webster 2003

provided in better program outcomes (eg health and education), increased industry productivity, economic growth¹⁵.

To address these issues, there are three processes which agencies can adopt and embed within management systems. These processes in themselves form part of the organizational capital of the organization and resources are needed to support these functions and their management¹⁶. The processes can be broadly defined as:

1. Identification of Intellectual Capital Assets
2. Product/Service Creation
3. Commercialisation path of offerings

3.3 Identification of Intellectual Capital Assets

In order to maximize value from their intellectual capital, agencies must identify the intellectual capital assets they hold. Much of the current under-utilisation of intellectual capital identified by the agencies appears to be due to insufficient information about their capabilities/resources which impedes effective decision making¹⁷.

The identification of intellectual capital assets provides an organisation with:

- ➔ an indication of its capabilities;
- ➔ the capability of better project planning and management; and
- ➔ the ability to capture all benefits from projects during their duration including improved staff competencies.

The identification of intellectual capital assets requires a system of "registers" which can be utilized when developing projects to ensure that the value from all resources is being realised.

¹⁵ Webster 2003

¹⁶ Al-Ali 2003

¹⁷ Zambon 2003 p XX, Hunter 2003, Wyatt 2003

Human Capital Registers

- ➔ Skills and competencies of personnel (not just formal qualifications)
- ➔ Cross referencing of projects and teams
- ➔ Mentoring relationships

Organisational Capital Registers/Manuals

- ➔ Intellectual property: its monetary value (licensing revenue, potential “market”) and cost of maintaining any patent or other formal protections;
- ➔ Research and development projects undertaken and currently in progress
- ➔ Operating processes and procedures

Relationship Capital Databases

- ➔ Stakeholders, including potential competitors
- ➔ Target “Markets”: e.g.: industry sector, clinical patients
- ➔ Networks that can be leveraged to achieve outcomes

Such registers/databases require active use (and maintenance) to be of benefit and for organisations to be able to manage and generate further value returns on their intellectual capital and in reality form the basis of culture change and an integrated management strategy not merely a tool.¹⁸ There are obvious practical issues associated with implementing and maintaining such systems with many millions of dollars having previously been spent on massive systems that were not utilized. The secret may lie in the incentives for their use and sharing knowledge and information rather than adding another layer of additional work into already busy work schedules¹⁹.

Adequate support and resources are needed to coordinate this function and provide information to all areas of the agency about potential synergies and opportunities that the capabilities captured in these registers represent. Dedicating resources to this function will potentially save the organisation time and money by ensuring that effort is not needlessly duplicated and that lessons learnt are shared.

¹⁸ Nermien (2003)

¹⁹ Hunter 2002, Burton Jones 1999

The organisation can then demonstrate that it is optimising use of its resources when producing desired outcomes. It also enables the identification of gaps where external resources may be required. This allows the agency to justify existing funding levels, bid for the required additional funding, clearly identify non-core activities that should become self funding or income generating activities.

3.4 Product/Service Creation

The combination of resources to produce a product/service is the most difficult step to manage in the process of extracting value from intellectual capital²⁰.

In terms of intellectual capital commercialisation, the “product” is often the expertise and knowledge, i.e. “know-how”, that is embedded in the organisation. This generally resides in either individual competencies or the organisational processes that have been developed to deliver a project or policy outcome. The difficulty in exploiting intellectual capital in either of these forms is that the transfer of knowledge in the initial engagement often results in a situation where that “know-how” can only be sold once as the first purchaser is now also a holder of the base knowledge.²¹

This is an issue many agencies face with their consulting services where the fee paid for the initial service is too low for the research and development processes that generated those skills and processes²². The answer to this issue comprises appropriate costing of the service provided, appropriate use and leveraging of existing know-how (and not developing new “cinderella” activities) and appropriate “market” research to determine both existing competition and further end user needs and application (ie to determine if there is more than one application to warrant undertaking this activity at any cost).

The **first stage** to this process is to place the activity of product development in the context of the organisational business model used to deliver that particular project or program. The business model, comprising its combination of resources, will play a determining role in how the product/service is to be packaged (Refer to Appendix B).

Most organisations understand how their resources are combined to produce the outputs required from R&D projects as part of their day to day operations. However the difficulty for

²⁰ Wyatt 2002, M’Pherson 1999, M’Pherson 2001, Peppard and Rylander 2001, Bontis & Giraldi 1998

²¹ Hunter 2002, Webster 2002

²² Consultation

most agencies lies in the ability to place boundaries around the outcomes of their operations and offer these to an end market. Project specific outcomes are generally specified by the original funding submission and further outcomes maybe possible through alternate uses of those outcomes e.g. for another field or application outside what was required by a contracting party.

Identification of alternate outcomes:

Questions to be considered in the identification of alternate outcomes and when defining the product or service are:

- ➔ Is the “know-how” end use specific (eg such as increasing pasture production) or is it a process that may have many applications?
- ➔ Does the “know-how” require operational manuals or software applications to support it?
- ➔ Can the agency claim unquestioned ownership or use of the “know-how” or is it built on previously existing formal intellectual property?

In order to do this the following information needs to be determined, assessed and managed throughout the development of the project and needs to commence with project scoping and planning:

- ➔ Define the market need for undertaking the project.
- ➔ Identify key staff involved in developing, maintaining and protecting IP and know-how;
- ➔ key staff competencies utilised and developed during the project;
- ➔ Nominate potential outcomes expected as formally protected IP (patents, copyright, trademark, plant breeders rights) with uses defined and place value on identified formal outcomes
- ➔ Nominate any additional (outside the scope of the original project brief objectives) IP or knowledge outcomes from the project and alternate potential uses
- ➔ Outline proprietary “know-how”/expertise that enables the project (eg. supporting software, operational manuals, training, trade secrets) and cost of replacement and/or potential market value
- ➔ Define implicit know-how and processes and the rights (ability) of partners to use knowledge outcomes outside the specified field of use.
- ➔ Acknowledge and include some flexibility to negotiate over unexpected outcomes.

As the project progresses the agency should regularly review whether or not the outcomes:

- are as intended;
- provide any opportunities that have additional applications to those sought by government or any partners;
- provide improvements on existing solutions and methods and to do this the agency should be aware of existing competitive “products”

Once the agency has defined the potential market offering it should explore the potential to bundle, partition and brand the “know-how” in order to establish quality and expertise ownership. This is particularly important for “know-how” that cannot be formally protected as “branding” but can allow the agency to establish its credentials as a quality control mechanism thereby opening opportunities for income generation.

Branding: Due to the intangible nature of “know-how” and its susceptibility to free transfer, branding is very important in placing boundaries around the market offering and providing some protection from exploitation by other parties. The development of a brand involves creation of a market perception of the value of the offering. Two important components of branding are image/logo design and trademark. These can provide some formal protection for the service offered. The brand association then provides your product with market definition and visibility. Coca-Cola is perhaps the best example of this, although others such as Rolex, Gucci, trade on a similar approach.

Bundling: Combination of a number of components from different projects for a secondary purpose can be extremely powerful. It may be the utilization of IP from one or two projects with know-how or operating procedures from another. The use of registers and dedicated resources to manage IC assets provides an organization with the ability to identify opportunities for cross-project bundling. Brand can then be used to identify the bundled items as a recognizable service or product.

When this approach is taken with consultancy services there is generally a need to combine the brand with an accreditation/endorsement framework. The endorsement/accreditation framework is a means of maintaining some control of “know-how” in those situations where the consultancy services are based on transfer of knowledge (ie it avoids/reduces the problem of spillovers). *The product offering is usually a combination of training and associated materials (eg. operational manuals, quality control guidelines or tip sheets).*

In practice this operates in a similar manner to franchising or licensing framework. The main issue is continued maintenance of service quality through acceptance of endorsed standards. This is more difficult to obtain than product quality for which there are a number

of quality control standards that can be used as a guide. An illustration of such a model is provided at Appendix C.

Partitioning: The reverse of bundling which involves the selection of part or parts of an individual project and combination of those under a unique brand. The intellectual capital involved is then able to function as a dual purpose entity. Delivering value to the agency in its original purpose and delivering income generation as secondary product. Care must be taken that secondary use and income generation does not negate ability of agency to use the intellectual capital for its primary purpose. An illustration of such a model from a large corporate is provided at Appendix D.

Assessment of Market Opportunities

As part of the project planning cycle agencies should identify the “market”/client base(s) that the project is to address and other users/markets that may be interested in the outcomes. These lists should include:

- List of potential customers/clients
- The needs of those customers – this will normally have been the rationale for the project
- How the customers operate – where will the outcomes of the project under consideration add value to this target customer group
- Where in the customer decision cycle the outcomes will fit.

Specific effort should be made to define target “markets” in terms of which industry (fields of use), what geographic boundaries may apply and what special access routes there are to those markets. The definition of market opportunity will relate to the solution(s) the ‘know-how’ can offer and will be directly related to the benefits offered to that target market or end user: which may include:

- Increased productivity
- Decreased costs
- Increased sustainability
- Increased quality
- Increased efficiencies to users as well as across the supply chain or channel to market.

It is possible to consider different markets separately where pricing and bundling is concerned and care should be taken to research and segment the market as much as possible.

This is particularly important where the outcomes of a project may be aimed at a public good service in a domestic market – ie within State or Australian boundaries or where the outcomes may have broad applications in other industries than that which originally intended. Failure to segment can potentially result in lost opportunities for income generation in those potential markets in which there is no public good rationale for providing a service to users on a fee for service basis.

It is important to consider that each market segment is likely to require customisation to meet its needs. There will be cost in this customisation. Care needs to be taken to ensure that this cost is factored into the commercialisation decision and appropriate resources are allocated to undertake that customisation. This will be a somewhat iterative process due to the need to establish what the potential benefits statements/applications are to these markets.

3.5 Commercialisation Path

The commercialization path for intellectual capital in practice is the production path for many more tangible assets. The path starts with the idea and moves through all the stages of

- a) Identifying the appropriate delivery mechanism for the product or service
- b) Quantification of cost of developing the product or service and determination of an appropriate pricing strategy (eg loss leader, competitive approach, price driver etc)
- c) Value of the investment in terms of servicing its potential “market”

Delivery mechanism

An important component of market analysis for public sector agencies is the planned delivery mechanisms for project outcomes. Under most Government guidelines there are a number of delivery mechanisms available to public sector agencies. The main delivery mechanisms generally recommended under public sector guidelines are:

- ➔ Free distribution/service delivery
- ➔ Cost of provision/cost recovery
- ➔ Provision of expert advice/consulting
- ➔ Sale of product/service/capability
- ➔ Licensing and franchising
- ➔ Collaborative ventures.

Commercial-in-Confidence

The first two of these 'delivery mechanisms' are pricing strategies or constraints and will often be determined as part of the pricing strategy of the relevant jurisdiction. It is important that this is recognised as it tends to force a cost-based rather than value- and benefit- based approach to commercialisation.

If the agency cannot service all deliverables on its own, it may have the ability to utilize its existing networks and supply chains to fill gaps.

Free distribution through no charge access and distribution of knowledge is a key issue for public sector agencies particularly in ensuring that no secondary user of that knowledge derives an exclusive benefit. An illustration would be where the agency has not patented/protected the outcome of research on the grounds that it is public good and free access should be provided. If the results are not protected a third party may take the initiative and protect by some other method over which they can exert control with the result enabling them to derive income from that IP with no obligation to pass any of that revenue/credit to the original creators.

In terms of intellectual capital and know-how management, this presents a strong case for public sector agencies branding and trade-marking their offerings even if they use a free and open access system. This claiming of ownership rights prevents loss of value through restricting access to the "know-how" outcomes and consequently constraining any unauthorised 3rd party use of those outcomes for revenue generating where the agency receives no portion.

Cost provision/cost recovery is a pricing regime that is based on charging users based on recovering the cost of delivering the service and on occasion overtime recouping the costs of development. Similar issues apply to this as with free distribution.

Provision of expert advice is similar to the agency engaging in consultancy work. This advice normally takes the form of decision support. The issues for agencies in using this form of knowledge transfer are twofold.

- Need to protect the know-how that supports the advice so that it can be used both by agency internally and for other clients.

- Need to ensure that provision of advice does not give the recipient the right to change for access to the underlying “know-how” without the agency getting some recompense. This can be handed by a legally enforceable consulting agreement which ensures that the agency has the right to reproduce its “know-how” and that trademark or copyright protections are used on the solution to ensure that the expert advice can be utilised by the agency and that the agency has access to the ‘know-how’ generated in the development of that advice. It is important that this advice is covered by appropriate disclaimers to cover the organisation with regard to liability and warranty issues.

Assignment or Sale is the once off sale of “know-how” for a lump sum payment. The issue with this approach to know how is that the agency has lost control of the know-how which results in similar potential issues to free distribution without appropriate protection. This approach should only be used where there is no public good element of to the “know-how” and it is not required for the agencies internal operations. If the item has public good element (i.e. it needs to be universally available without the monopoly premium of private ownership) or required for internal operations, sale could result in situation where the short term gain (of capital injection) is worth less than ongoing costs to provide public access or agency utilisation of required elements.

Collaborative ventures include strategic alliances, partnerships and joint ventures and involve the establishment of formal and informal relationships with other individuals or businesses to share resources, ideas or capital. Franchising and licensing models would be included under this type of arrangement.

Licensing or franchising as means of selling product or service capability is one of the best mechanisms of maintaining the balance between control of the “know-how” elements of intellectual capital and ensuring wide distribution. The terms of the “franchise” will contractually tie the franchisee to a controlled quality assurance process.

Licensing agreements that enforce accreditation as means of quality control enables the transfer of any trademarked/branded knowledge to be controlled on two levels:

1. the recipient of the ‘know-how’ can become a practitioner of the technique or process, this can be done through courses and licensed accreditation processes, workshops or standard consultancy
2. training the trainer so that the recipient can earn an income stream from the dissemination of the “know-how’ and secondary products developed from that “know-how”

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A licence or franchising agreement should outline the terms and conditions under which the recipient can use or reproduce the “know-how” provided by the agency either through expert advice or a training program. The terms of such an agreement should include:

- specification of the purposes for which the know-how/process can be used;
- specify the recipients rights to modify the “know-how’ and what revenue (through royalty) and access must be returned to originating agency;
- specify the recipients right to distribute ‘know-how’ to end users and customers and the conditions of that distribution. This is where use of accreditation standards can be of use to clarify the relationship and ensure quality control – in a similar manner to ISO standards.

This model allows the public sector agency to continue to collect a benefit from its “know-how”, continue to develop and improve that secondary IP, keep resources that lead to further development and secure a return on that investment without the need to focus significant resources on activities that are not core business. However, resources do have to be dedicated to negotiating and administering licences agreements – particularly ensuring adherence to the terms and payment of the fee by the recipient.

Once the delivery mechanism has been established a risk assessment needs to be done.

Risk Management.

Risk needs to be examined at all stages of the process. In the research and development phases the following risks need to be considered:

Technical/scientific risk – The consequences of technical and scientific risk relate to both feasibility and liability if the project does not meet its claims. Issues to be considered include:

- will the results of the program provide the desired outcomes for target market?
- Is the product technically feasible?
- are there likely environmental or social risks to products being developed – eg GMO food?

Skills and competency risk:

- how broad is the agency’s capability in the required skill sets?
- is there a succession plan in place to replace lost skills?
- Does the allocation of skilled workers to this project jeopardise other projects?

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There are a number of risks that need to be assessed from the market perspective:

- lack of market uptake this is the other side of technical risk – a process may work but the market may not accept that the product/service is addressing its perceived needs
- likelihood of recipient of intellectual capital breaching the agreements
- the likelihood that the proposed solution is not competitive with existing products
- brand risk due to poor delivery or governance
- financial risk due to liability and other exposures
- operating risk due to organisational resources being tied up
- the ability to protect and defend rights to intellectual capital embedded in know-how – the risk of spill over

Costing, valuation and pricing

The appropriate pricing strategy will be determined by agencies' core business and strategic interests. In some cases this will have been pre-determined by the approval process for the project/program. The valuation for the project will be dependent on the outcomes required from the project, the delivery method specified (free of charge as public service, cost recovery, for the project, and the associated fee structure) and the risks associated with delivering the product to market. The outcomes from this process provide:

- a demonstration of value to government and/or to client base for taxpayer funded dollars where those services are provided as a public good – this addresses the issue of clients utilising the products/services and expectation of free access, and
- a basis for fair value negotiations for commercial outcomes.

All outputs should be valued and priced regardless of whether agencies intend to pursue a commercial strategy. Without complete pricing evaluation, agencies cannot make a case for the value they are delivering to government or clients in terms of benefits provided. This is particularly important for value propositions where the chosen delivery model is free of charge – clients need to know that they are being provided with value.

As the first step in the process of valuation the organisation should quantify the costs required to develop the output. This process provides a full costing for the proposed product or service – it is not a proxy for valuation. The combination of this step with the valuation will assist agencies to develop a return on investment figure for the benefits obtained from their intellectual capital – whether this is measured by increased industry performance or consulting revenue raised.

Items to consider when undertaking this process are:

- material costs: isolated costing of tangible assets (eg. Cash investment, laboratories, raw materials) used to develop any IP and associated skills and processes required for implementation;
- labour costs and investment: wages, fees to contractors, workers compensation, insurance, superannuation contributions and training;
- apportioned overhead costs
- any profit and incentive component
- the cost of replacing skilled personnel or the cost of training personnel to implement the program.

This process enables clear boundaries to be drawn around the cost of producing a relevant project outcome.

At present many public sector agencies are subject to pricing policies that are centrally developed in the organisation with relation to cost recovery principles and an assumption that cost can be used as the determinant of price. This practice must be replaced with a product/service specific approach that is developed in the context of the appropriate “market” and delivery option.

Applying a market-based approach requires significant time and effort to research market information relevant to the particular service or product being proposed for distribution. It cannot be based on the cost of development or a centralised pricing regime which is not market focussed.

There are three essential elements to the valuation:

- identifying the potential market price that could be generated from the product or service (regardless of the actual delivery mechanism chosen this should be done as it provides a value on the service/product);
- assessment of the duration of potential benefits; and
- assessment of the risk associated with forecasted benefits.

With regard to some free of charge activities an additional step should be taken to determine if the provision of these services free of charge will impede later attempts to sell these services in other markets.

These steps need to be undertaken for each identified market segment – as discussed in section 3.4 above to ensure this

This process is detailed in the AIC Guide to Maximising Intellectual Property Value and provides organisations with approaches to justify their cost/benefit positions. In the case of a private sector organisation a decision to proceed or not would be made from here. For public sector agencies such a decision is complicated by the fact that some of the project services may have to be provided free of charge to users.

4.0 CONCLUSION

Intellectual capital management is an essential component of effective knowledge transfer. The effective management of intellectual capital, particularly dissemination and commercialisation, can provide significant benefits to both the agency and the public.

The development of systems and appropriate allocation of dedicated resources to the proactive management of intellectual capital, particularly the identification of human capital resources, will allow public sector agencies to extract maximum value from their resources by facilitating decision on the best possible deployment of those resources. These systems will also allow agencies the potential to increase income generated from intellectual capital currently not being utilised and to ensure that maximum benefits are delivered to stakeholders in the provision of services.

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6.0 APPENDIX A - GLOSSARY OF TERMS

There are a number of terms that are used when discussing intangible assets. While many of these are used interchangeably their coverage is not always the same.

Financial Accounting: Financial Accounting has its own interpretation of what constitutes intangible assets and has rules to record these assets and actions.

Intangible Investment: is the term for investment in the creation of these non-physical sources of future benefits for organisations. The accounting focus is on assets not processes or activities that add value or convert the assets into future benefits. This covers similar territory to register of intellectual property.

Intangible Assets:

Intellectual Property	separately identified intangible assets	non separately identifiable intangible assets.
Intangible assets with legal or contractual rights including patents, trademarks, designs, licenses, copyrights, film rights, mastheads	Information systems, networks, administrative structures and process, market and technical knowledge, human capital (embodied in codified form), brands, intangibles embodied in capital equipment, trade secrets, internally generated software, drawings	Prior intangible investment embodied in organizations, management expertise, geographic position, monopoly market niche.

Intellectual Capital: is the collective term used to describe the resources of an organisation that are not physical assets or cash and are intangible. This is a broad area that encompasses a wide range of different assets and processes including:

- ➔ Skills and competencies of the workforce (i.e management expertise, technical knowledge, know-how)
- ➔ legal or contractual property rights (i.e patents, trademarks, designs, leases and licences)
- ➔ organisational processes (i.e information systems, networks, administrative structures and processes, market and technical knowledge, brands, trade secrets, internally generated software, drawings).

This differs from the accounting definition of intangible assets in that it includes processes and competencies that may not have demonstrable legal protections or control.

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Intellectual Property: Assets with legal and contractual protections such as patents, brands, mastheads, registered trademarks - A sub-set of both intellectual capital and intangible assets.

Non-patentable Intellectual Property: Intellectual Property that can be owned and controlled through use of legal and contractual protections such as registered trademarks, branding, copyright, franchise agreements. These non-patent approaches are generally more appropriate for the combinations of assets and activities that form the basis for many intellectual capital products.

Knowledge Appropriation Term used to describe investment in patents trademarks copyright , design, protection, research and development, licensing arrangements, human capital: recruiting new staff, developing training staff, investing in intangible assets: existing special skills, experiencing knowledge of individuals, in the performance of teams, and in the organisational architecture and retain specific to particular workplace enterprises -- aspects of tacit knowledge. This results in ownership and control of these items being made explicit therefore able to be demonstrated and protected in market.

Goodwill:

- ➔ customer equity: customer databases; customer loyalty and satisfaction;
- ➔ distribution relationships and agreements.

Knowledge: Has more than one level and different types require different strategies for dealing with them.

Data: factual raw material or signals with no meaning.

Information: data has meaning and is refined infrastructure functional form within system; for example, customer supply databases.

Explicit: (knowing about) codified or articulated -- can be written and easily transferred. Codification may include organisational manuals or specialised database, but may also take the form of standardised techniques of investigation or templates for design processes or operational reporting.

Tacit knowledge: (knowing how) - understanding which cannot be directly transferred between individuals rather it will be revealed through application, practice and social interaction. Most common in traditional manual crafts and professional firms like law traditionally developed through master --apprentice relationship, through which observation, discussion of practice over long period was expected to develop knowledge to an acceptable level of competence.

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“Know How”: skills of workforce that may be captured in operational manuals or business processes. Generally non-formalised processes that are often tacit in nature and require a transfer of knowledge and ability. This creates issues for control of know-how when disseminating for income generation purposes.

Knowledge Transfer: Depending on the type of knowledge different mechanisms are used to transfer it.

Socialisation: tacit to tacit knowledge through direct share experiences.

Externalisation: converting tacit to explicit knowledge so that can be used by others use of dialogue, diagrams, prototypes.

Combination: of explicit knowledge into new systemic forms for better application *Potential:* knowledge is reorganised through meetings, documentation communication networks.

Internalisation: involving explicit to implicit knowledge, ie becomes part of an individual's personal know-how -- similar to learning by doing.

7.0 APPENDIX B: BUSINESS MODELS AND VALUE CREATION

An organisation's business model and strategic aims are a major determinant of the manner in which an organisation's intellectual capital can be utilised.

To successfully utilise their organisational intellectual capital, public sector agencies must be clear about which value creation model the organisation is employing in relation to each project. This will determine the relevant development path for the utilisation of intellectual capital, particularly through assisting in the identification of which elements are most important for project success in the first instance, and secondly for which techniques need to be applied .

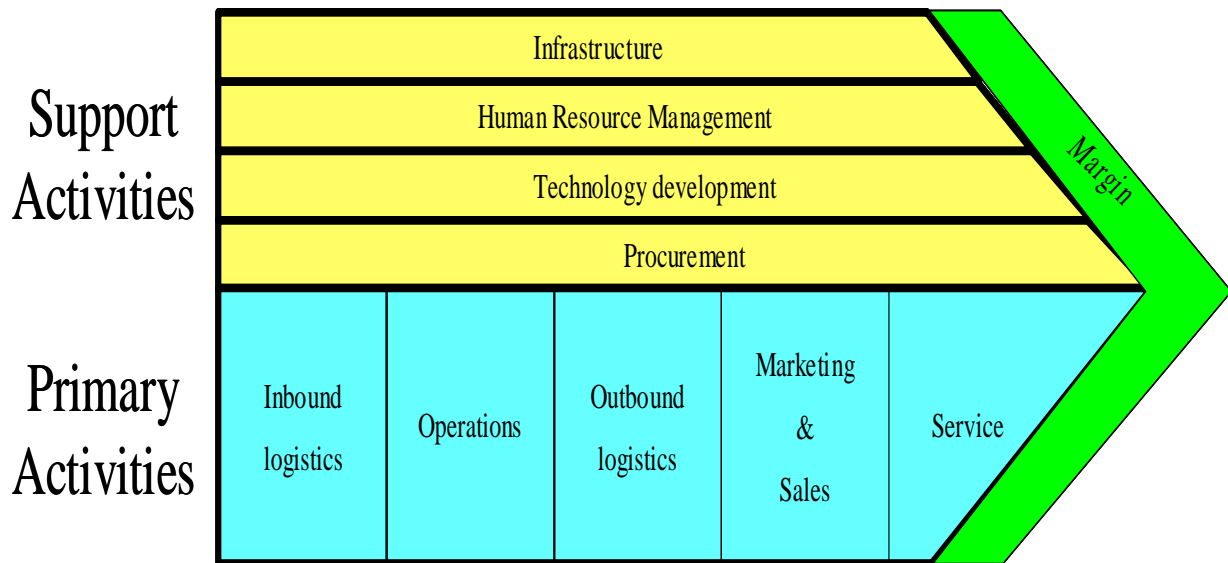
Organisations are essentially sets of resources deployed to achieve an objective. This is achieved through the use of internal systems (organisational structure) which link the various components of the organisation. The organisational structure should be such that it supports the organisation by facilitating the creation of value required by its objectives.

Three basic models of value creation and the relevant intellectual capital resources required to deliver them are generally used when discussing value generation in organisations. These models have been developed in work by Michael Porter, and all involve four support activities. These activities align with intellectual capital resources and which is the most critical depends on the activity undertaken by the organisation.

- ➔ Infrastructure – Process Capital
- ➔ Human Resource Management – Human Capital
- ➔ Technology Development – Innovation Capital
- ➔ Procurement – Relationship Capital

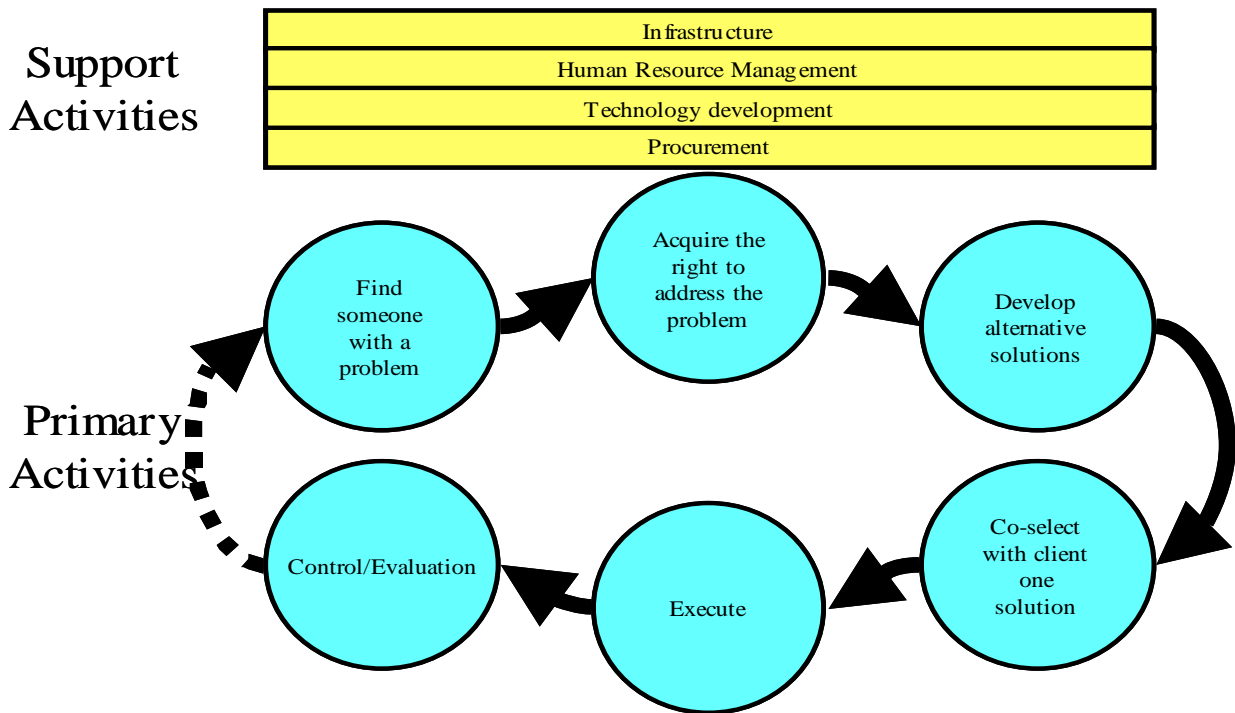
1. **The value chain.** Popularised by Michael Porter, this is the system deployed by a traditional factory. Primary activities are linked into a *sequential chain* (inbound logistics, operations, outbound logistics, marketing and sales, after-sales service). Four support activities (infrastructure, HRM, technology development and procurement) underpin these primary activities. The principle of a value chain is to convert inputs to outputs. The value generated resides in the output, not in the organisations that produce the output. Illustrations of this model would be organisations involved in primary production or traditional manufacturing.

Source: Porter, M.E. 1985: *Competitive Advantage; Creating and Sustaining Superior Performance*, The Free Press



IP is easy to manage in this model because there is a defined product sought as an outcome. Most public service offerings don't fall into this category. Human resource management factors relating to skills needed to manage the IP involved in the product, and relationships, are not accounted for in this model as it focuses on tangible product delivery..

2. **The value shop.** This is the system deployed by advisory service firms (consultancies, legal partnerships, and accounting practices) and applied R&D organisations. Here we find the same four support activities, but now the primary activities (facets of client-contracted problem solving) are linked into a *repeating cycle*. The principle of value shops is to solve problems. The value generated resides both in the solution and in the organisation that generated the solution, and are inseparable. Examples of organisations that use this model are business professional services and engineering consultancies.

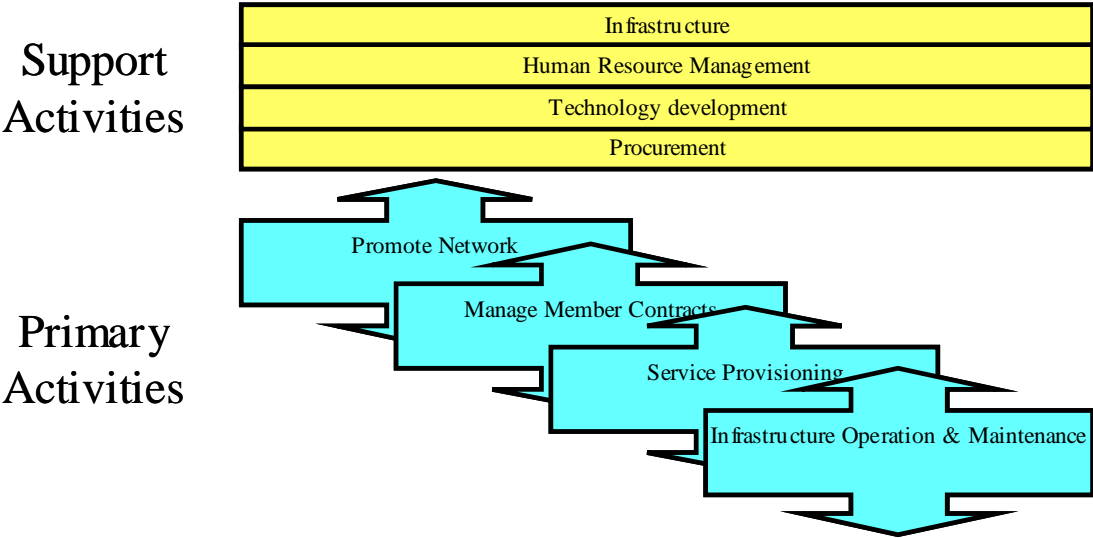


Source: ICS Ltd. Research and Stabel, . B., Fjeldstad,Ø. D.: *Configuring Value for Competitive Advantage: On chains, shops, and networks*, SMJ, Vol 19, No 5, 1998

This is the model that many public sector agencies utilise with consulting services and where they feel they are not generating sufficient value, because the price they obtain for services is not sufficient to cover the loss in the transfer of expertise away from the organisation. This is particularly the case in those organisations trying to initiate change in practices. Markets tend to be defined geographically – the improvement in production of competing markets ultimately hurts the home economy.

- 3. The value network.** This is the system deployed by enterprises that generate value by connecting actors that benefit from becoming interdependent whilst remaining independent. Again, the four support activities are present. However, the four primary activities (network promotion, contract management, service delivery and infrastructure operation and maintenance) are conducted *in parallel*. The principle of value networks is to generate connection opportunities and to enable service access. The value generated resides in the interconnection made and the services offered. Internet companies, government programs based on building networks in a sector, and membership organisations such as golf clubs and co-operatives provide examples of this model. This is the most complicated model to understand as it has the heaviest reliance on intangible assets to explain value creation in terms of both inputs and outcomes.

Many public good programs operate on this model assuming increased take up of practices eg health outcome, crop production. This model faces issues of pricing and valuation because of the difficulty of market definition.



8.0 APPENDIX C – TRIPLE P AN ILLUSTRATION OF BUNDLING

8.1 Introduction

Triple P – Positive Parenting Program – was developed in Australia by Professor Matthew Sanders and his colleagues from the Parenting and Family Support Centre (PFSC) in the School of Psychology at The University of Queensland (UQ).

Since it was established, Triple P has grown slowly but steadily and has a presence in 12 countries. Currently there are 7 employees in total at the Centre.

Triple P has unique products and concepts, and has won widespread international acclaim. The program has been designed and developed through more than 20 years of sound research. The brand is a primary asset, backed by the research, and the continued involvement of Matthew Sanders, founder of Triple P and Director of the PFSC.

8.2 The importance of good parenting

It is often said that children are a reflection of their parents. According to Matthew Sanders, “The quality of family life is fundamental to the well-being of children”²³. Although family relationships are well-recognised as being important, parents generally receive little or no preparation for parenthood; most learn on the job and through a process of trial and error. Mathew believed that in order for society to function well, it needed well raised children, and to achieve this, programs targeted at parents were required.

8.3 Triple p background

Triple P is a unique, multi-level model of family intervention that promotes good communication and strong relationships between parents and children. It was developed by Professor Matthew Sanders and his colleagues from the School of Psychology at The University of Queensland (UQ) in Brisbane, Australia. The idea originated in 1979 when Matthew began a PhD on the value of good parenting and its (positive) effect on the resulting behaviour of children. His research, named the “Positive Parenting Program”, was thorough

²³ Triple P-Positive Parenting Program: Towards an Empirically Validated Multilevel Parenting and Family Support Strategy for the Prevention of Behavior and Emotional Problems in Children (1999) Clinical Child and Family Psychology Review, Vol.2, No.2.

and scientifically established the positive link, which he then began to promote to seek further funding support.

In 1992, a major turning point in the development of Matt's research was his move from the Department of Psychiatry to the Psychology Department. He raised funds and four years later, set up the Parent & Family Support Centre (PFSC) specifically dedicated to the promotion of his ideas, and to provide resources for further research. The centre grew slowly and provided training for appropriate affiliated staff, delivered presentations, and developed teaching and marketing materials. It used Families International Publishing, an existing company, to produce and publish much of its material.

Matthew Sanders

Professor Matthew Sanders believed that in order for society to function well, it needed well raised children. In order to achieve this, programs had to be specifically targeted for parents. Matt endeavoured to make something that every parent could use. Using his "Positive Parenting Program", he became a frequent conference presenter and was significantly involved in the program's marketing and public relations. The key differentiator for Triple P from other advice books and programs was its firm basis in solid scientific research and established mass of scientific evidence. Matt created the 5 step system – 'TP for every parent', and his aim was to reach every parent. Matt concentrated heavily on promoting the Triple P methods, which were well received by government and other bodies because of their basis in sound research. Exhibit 1 shows the details of the Triple P model.

8.4 The products and services

Triple P are unique products and services. Triple P's products are training courses and publications, including tip sheets, books and videos. The program was developed as a system of parenting and family support to assist parents to promote their children's social competence and manage common developmental and behavioural problems and the product range covers all aspects of the child life cycle from infants to teenagers.

The actual market for Triple P's products comprises government and health systems, criminal systems, and other government bodies. The products are delivered to parents by trained staff such as community health workers and social workers. In other words, the products are 'consumed' by those parents being trained, and paid for by the various institutes employing the trainers. Although the buyers are government agencies, the benefactors were the parents and society at large. Parents are made aware of the products through mass media and other means of awareness advertising, including pamphlets and magazines. The real success of Triple P in gaining access to its consumer market lies in the engagement of an effective channel to market via the community trainers with the service being paid for by

government as the key stakeholders with a critical whole of community approach and an interest in reducing associated spending elsewhere.

8.5 Growth in demand

Triple P began as an internal university initiative. Since its development, Triple P has grown slowly but steadily, both in brand recognition and product range. The pace of research and the lack of focus on commercial outcomes had been the primary reasons for the slow growth over the years. The fact that Matt was such a central figure and had limited time did not help.

However, by the end of 1999 and early 2000, it became clear that the PFSC, located within the university, was no longer capable of handling the volume of training as well as other activities for Triple P. Universities were not set up to be able to deal with commercial aspects of such businesses. Furthermore, given that Matt had the original aspiration to reach every parent, Triple P had a goal to expand beyond Australia into overseas markets and countries.

Consequently, a decision had to be made to either scale back, or spin off from the university. Spinning off a company would involve UniQuest, the technology and consulting company of The University of Queensland. UniQuest was involved in licensing and other various methods of technology transfer for the majority of the University. However, Triple P was a unique case. Its products were based on social research and an unusual product development process.

8.6 The product development process

Product development was a long and complex process with each 'new product' based on academic research. The process began with an expression of interest, and was then followed by sourcing grant funding (usually from a trust) to pay for the research, which was often performed by a PhD student. The PSFC was used to also provide research resources. Research generally takes 3 to 4 years.

At the conclusion of the research program, limited pilot trials of a prototype were undertaken. Further developments were made, larger scale trials carried out, and the product then released to the market. The market customer was usually a government agency, such as the criminal systems attempting to reduce crime through addressing, for example, alcohol abuse. Triple P distributed the products and therefore profited directly from the outcomes of research which was originally funded by a not-for-profit organisation.

Since the development of any new product must be preceded by research into the specific area of interest, universities and students were inevitably involved. Universities, however, rarely had the funds to pay for the research and these had to be raised from other sources, usually private trust funds. Consequently, this often raised issues with the trusts as someone

else had benefited financially from their investments. Academics also had their own research agendas, such as a written publication from the findings of the research, which coincided with the research paid for by the trust funds.

8.7 Triple p incorporated

The start of 2000 saw an increase in demand for training and programs. However, the Centre's lack of resources and capabilities indicated that the company had grown too large to manage internally. Matthew Sanders faced the decision of scaling back or spinning out the company.

8.8 Conclusion

- Triple P was too big to remain within the university

9.0 APPENDIX D – BHPBILLITON FALCON

9.1 Background

In 1994, Edwin van Leeuwen was recruited by BHP to review the portfolio of R&D projects that were running at the time. He found that BHP was involved in the development of many leading edge technologies, but that many of these were way ahead of what was needed by BHP at the time, and many were discontinued. However, one, the development of a gravity gradiometer, was selected for continued research. Gravity gradiometry had been dreamt about as the ultimate exploration tool, as the gravity signal of ore bodies cannot be obscured by objects above it – ‘gravity doesn’t lie’. At that stage, the next step in the project required building a demonstrator unit in a plane, a feat which would require solving many substantial problems.

Development of the product required intense collaboration and problem solving. To enable the final application to be achieved, BHP had to develop and integrate many supporting technologies along the way. The result is world leading technology that has far exceeded all expectations, and provides BHP-B with a massive lead in the exploration of mineral deposits. Others, such as Rio, have tried to develop something similar but failed to even come close. Edwin attributes the success of the project to a number of issues, including strong support of senior managers, excellent project management skills, the ability to select a powerful and high performing team, the nature and extent of collaboration, the organization structure set up to allow the development of the technology away from the mainstream activities of BHP-B, among others.

9.2 Current Situation

The commercial aspects of the technology have been separated from the technology itself. Through use of a trade mark FALCON capabilities are sold to partners for a fee to assist them in reaching their exploration aims.

FALCON is a tool that assists BHP Billiton achieve its primary aim which is the extraction and sale of ore based commodities. However, it can have secondary uses as income generation by providing similar services to like organisations and others requiring survey data.

BHPBilliton has use of the technology for its exploration purposes and can gain an income by offering it to its competitors. Given that much of the terrain where FALCON is utilised is highly inaccessible the cost to competitors of extraction is likely to be high thus not likely to threaten pricing advantages enjoyed by BHP at this time.

Commercial-in-Confidence

Thus BHPBilliton is maximising the return on its investment by gaining an income stream but not decreasing its competitive position on its core business. This situation has been achieved by separating one part of the mining process and treating it as a stand alone product.