"Strategic Knowledge Management Solutions"

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A strategic knowledge management capability enables an organisation to combine its knowledge on markets and products with change adaptation knowledge to gain sustainable competitive advantage.

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1. Background

In recent years, information and knowledge are replacing capital and energy as the primary wealth-creating assets, just as the latter two replaced land and labour 200 years ago. The increased prominence of knowledge related economics from the beginning of the 1990's have co-existed with the development of a new view on business strategy that emphasise **resource efficiency** rather than the generally accepted competitive forces.

The Resource Based Perspective of corporate strategy[1] advocates the leveraging of resources and capabilities in many products for different markets rather that focusing on specific products targeting specific market segments. Competitive advantage can then be attained primarily through **knowledge driven dynamic capabilities**, which possess barriers to both imitation and mobility.

The term 'dynamic' refers to strategic responses required when time-to-market and timing is critical, the pace of innovation is accelerating and the nature of future competition and markets is uncertain. **Knowledge oriented dynamic capabilities** support adaptation to the changing environment through knowledge driven reconfiguration, integration and innovation of organisational competencies. Consequently, knowledge oriented dynamic capabilities provide the basis for **strategic knowledge management** enabling companies to combine their knowledge on markets and products with **change adaptation knowledge** to gain sustainable competitive advantage.

Knowledge oriented management theory as concentrated in two steams, the 'learning' stream and the 'intellectual capital' stream. In the former knowledge is considered as information with an applied interpretation process that guides action and the focus is on the different features of knowledge that could help managers to introduce knowledge oriented strategies and processes .
The 'intellectual capital' stream of research defines knowledge assets as a major part of an organisation's value and focus on classifying, measuring and managing intellectual capital (IC) to help performance improvements.

Despite the increased understanding of the importance of dynamic knowledge capabilities in strategy, and advances in knowledge management technologies, one area still seriously underdeveloped is the ability to link KM with strategy and competitive advantage.
Strategic Knowledge Management has many interpretations and meanings which often lead to a confused picture of how it relates to business strategy, why is important and how one goes about to develop knowledge management solutions.

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[1] Wernerfelt B. 1984. A Resource-Based View of the Firm. Strategic Management Journal 5: 171-180;

Wernerfelt B. 1995. The Resource-Based View of the Firm - 10 Years After. Strategic Management Journal 16(3): 171-174 .

2. The business challenge

The key challenge is what a company can do to succeed in a highly uncertain and dynamic market place.

A commonly accepted answer is increased speed of understanding of customer perceptions and trends and increased ability to respond faster than the competition to competitive challenges. In this case, strategic knowledge should help the company to act faster. The question is **what is the strategic knowledge that will enable the company to better formulate and execute its 'fast adaptation' competitive strategy?**

Would a company be more competitive if it increased its knowledge about its customers? The answer is there would probably be some performance improvement but clearly, it is not the solution. Apart from good customer knowledge, the company needs a capability to generate new knowledge to explain changes in customer patterns and to create successful responses**. It needs dynamic capabilities for "adapting, integrating, and re-configuring internal and external organizational skills, resources and functional competencies towards a changing environment".**
A strategic knowledge management capability enables an organisation to combine its knowledge on markets and products with change adaptation knowledge to gain sustainable competitive advantage.

3. The kBOS Strategic Knowledge Management approach

3.1 Rational

A strategic knowledge management capability enables an organisation to combine its knowledge on markets and products with change adaptation knowledge to gain sustainable competitive advantage.

A strategic knowledge management capability should facilitate early recognition of change patterns of from which possible explanations and therefore possible expected change trajectories can be made and then monitored. The key is to understand the change reasons in order to design appropriate responses taking into account the organisational constraints and optimising time and cost.

We need therefore to understand better the change patterns to define **context** that activates knowledge and knowledge development.
We need increased automation of knowledge extraction based on such **change context.** In most cases, the change context should also initiate l**earning cycles** aimed at the creation of **adaptation knowledge** that will support the development of the response. At this stage, the use of learning ontologies will provide a crucial tool in this area.

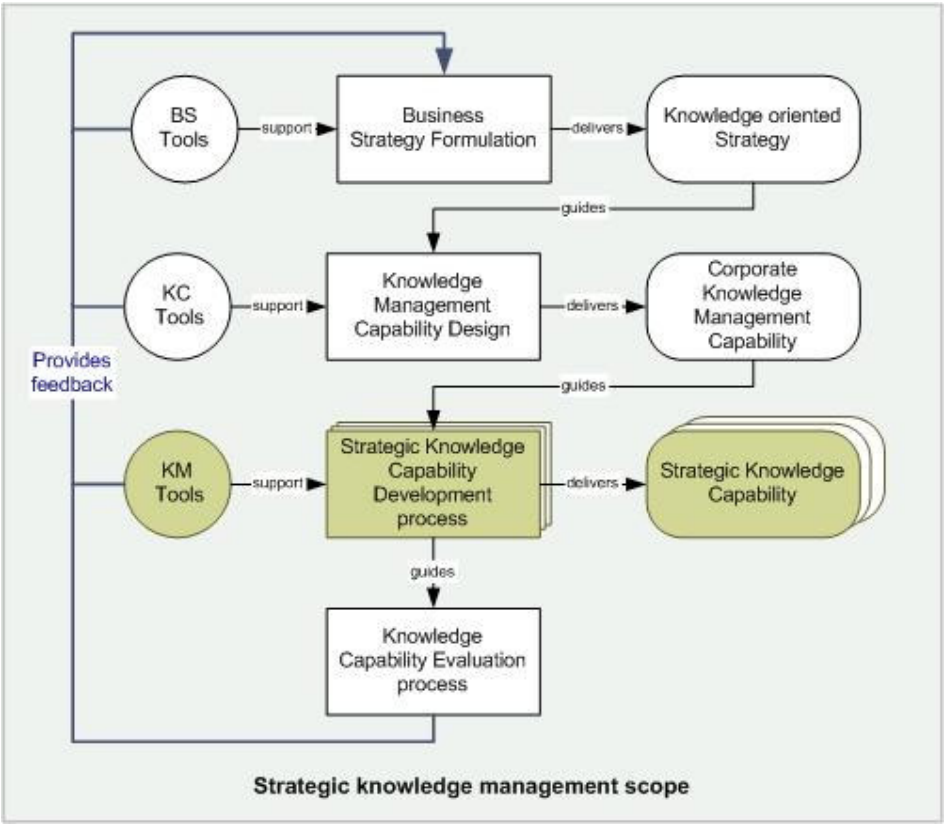
3.2 Strategic knowledge management scope

To link Knowledge Management with business strategy it is first necessary to establish an understanding of the advantage that comes from knowledge as a strategic resource enabling the company to better formulate and execute its competitive strategy.

For this, a knowledge view of the organisation must be created and used to define its knowledge oriented competitive positioning in the specific sector in which it operates. Next, an evaluation of current knowledge capabilities together with performance optimisation techniques will determine what needs to be done.

3.2.1 The main elements in the overall strategic knowledge management process

The overall scope of an INLECOM Strategic Knowledge management solution is described in the following diagram.

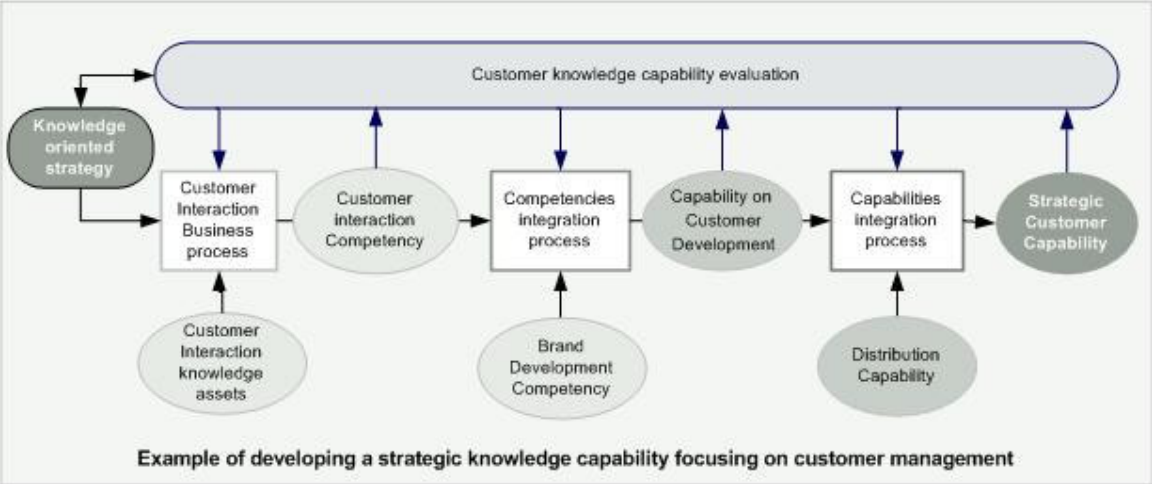


Strategic knowledge management scope

The basic process is to develop a knowledge oriented business strategy, which identifies the crucial areas where the company will build strategic knowledge capabilities (i.e. knowledge on products and knowledge on their adaptation/reconfiguration). A knowledge management capability must then be developed to support the development and management of the chosen strategic knowledge capabilities. The continuous improvement of all the elements in the strategic knowledge management process through appropriate feedback handling mechanisms and learning is highlighted.

3.2.2 An example of building a strategic knowledge capability for customer management

An example of building a strategic knowledge capability for customer management is shown in the following diagram to illustrate various aspects the process described earlier.



Example of developing a strategic knowledge capability focusing on customer management

With reference to the above diagram, it is first useful to differentiate between knowledge assets, competencies and capabilities.

Knowledge assets are the intangible corporate resources a company can draw upon to support the achievement its objectives/strategies.

Competence is the state of sufficiency of company-specific knowledge assets to achieve its objectives. The level of competence required is dependent on the environment and can be highly dynamic.

Capabilities represent company ability to integrate appropriate competences to achieve the organizational objectives.

Strategic Capabilities represent company ability to integrate appropriate capabilities to achieve the organizational objectives associated with competitive advantage.

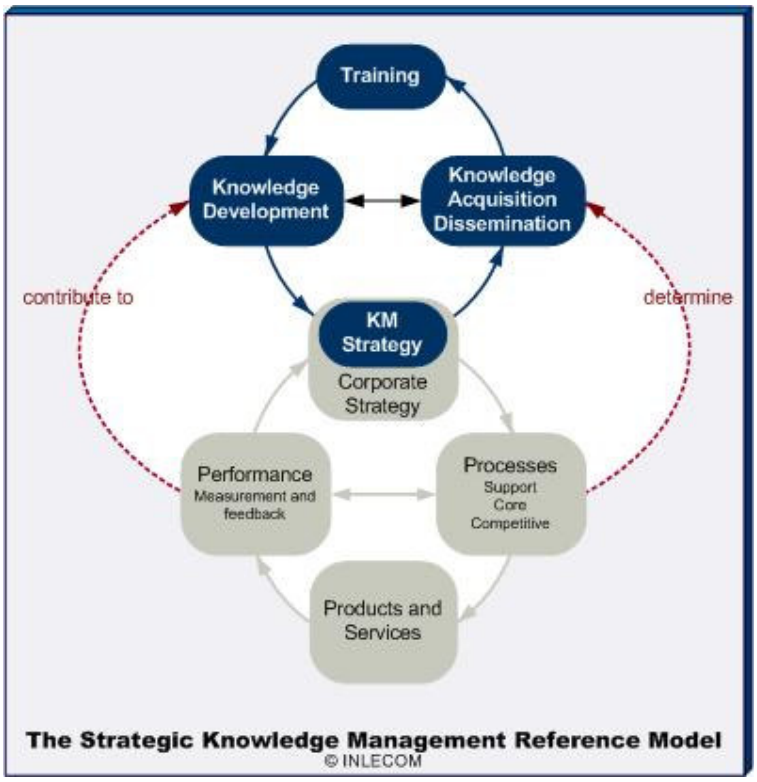
The basic building blocks are company-specific knowledge assets, which combine to form competences in turn used by organizational processes to provide capabilities suited to achieving corporate strategies. Each stage consists of recursive steps that keep adding on and modifying the building blocks until the necessary competence or capabilities are achieved.

Building strategic knowledge capabilities would normally require a long time. However, in most successful companies the majority of required knowledge assets and competences exist even though it may be dispersed or not managed.

From the point of view of the required knowledge, management capability it is important to point out the crucial issue is support for integration type processes the difficulty being the degree of automation offered.

3.3 The kBOS Strategic Knowledge Management Reference Model

The Strategic Knowledge Management Reference Model consists of a **knowledge management process** linked to the **overall business model** of strategy-process-product and performance control as shown in the following diagram.



The **business model** is represented by the following four interconnected elements:

- Corporate strategy including the knowledge management strategy;
- Business processes grouped under support, core and competitive categories;
- Products/services and other value outputs;
- Performance (emphasising both measurement and feedback handling).

The knowledge management process is integrated in the business model in three key components:

- The corporate strategy
- The business processes
- The performance management

The strategy link represents process integration; in other words, knowledge management strategy is treated as an integral part of the corporate strategy management process. The other two links at process and performance management represent feedback loops emphasising the dynamic aspects of business management.

4. Knowledge management strategy as part of corporate strategy

The role of corporate strategy is to create completive advantage by matching the opportunities of the environment with what the corporation is capable of doing taking into accounts potential risks and safeguarding the company's weaknesses from the threats of the same environment[2].

As mentioned earlier knowledge comes into interplay with corporate strategy at the following three levels:

- Strategy formulation (knowledge of the environment, of the internal capabilities and of potential risks);
- Designing knowledge management capabilities (today equally important as the development of IT or technology capabilities);
- Developing strategic knowledge based capabilities (combining knowledge assets, competencies and capabilities to achieve competitiveness goals)

In this section, some key issues are addressed associated mainly with the third level, namely strategic knowledge based capabilities.

4.1 Sustainable Competitive Advantage

A competitive advantage is an advantage a company has over a competitor or group of competitors in a given market, strategic group or industry (Kay 1993). Any company may have many advantages over another by providing higher customer value exploiting different capabilities such as a superior production system or customer service or lower costs.

Sustainability does not normally imply that advantages persist indefinitely but reflects the possibility and extent of competitive duplication. In many sectors such as financial services sustainable advantages are difficult to attain and competitive moves are rapidly imitated (Bhide 1986). Generally, competitive pressures are expected to dissipate competitive advantages in all sectors. However, where the resources underlying the advantage are limited in supply, superior returns can be sustained (Peteraf 1993) focusing attention on the nature of the firm's resource pool (See Annex 1 for a classification of corporate resources).

4.2 The Resource Base Perspective RBP

Over the last few decades, a diverse set of academic researchers and economists developed a new view on business strategy that emphasized resource efficiency rather than the generally accepted competitive forces. The Resource Based Perspective highlights that companies have differentiated resources, capabilities, and endowments. Further, these resource endowments are not easily changed nor are they easily discarded, at least in the short run, so companies operate

[2] "Resources, Firms and Strategies" Edited by N J Foss Oxford University Press 1997

with what they have. The resources-based perspective focuses on strategies for exploiting existing company-specific assets including knowledge assets. The resource-based perspective promises to improve understanding of strategy formulation addressing intangible resources, (Hall, 1992), for the growing knowledge-based services and knowledge-intensive industries (Sveiby, 1992).

One of the principal insights of the Resource Based Perspective is that not all company resources are of equal importance or possess the potential to be a source of sustainable competitive advantage. Much attention has focused therefore, on the characteristics of **advantage-creating resources**, which possess barriers to both imitation and mobility (Peteraf 1993; Teece, Pisano and Shuen 1997). The Resource Base Perspective of corporate strategy[3] advocates that competitiveness is sustainable primarily through dynamic knowledge capabilities, which can be difficult to imitate or acquire.

4.3 The Knowledge Management perspective

Knowledge assets as other resources are not of equal importance but unlike other resources, all knowledge assets possess the potential to be a source of sustainable competitive advantage. A key aspect of knowledge management strategy is to identify the priorities for developing specific knowledge assets to **advantage-creating knowledge assets[4]**.

Advantage creating assets will differ in each company, but as already mentioned a **knowledge driven responsiveness capability** is likely to provide a source of competitive advantage for most companies.

A knowledge driven responsiveness capability satisfy the criteria for difficult imitation by virtue that is based on knowledge about complex interaction between company internal resources, the company's customers and business partners which can be developed continuously to 'higher levels of intelligence'. Further, adaptation knowledge assets have no value outside the company.

5. The Business Process Perspective

Business processes implement the corporate strategy and provide essentially the corporate engine to drive the company towards its business objectives. **Strategic knowledge based capabilities are effectively highly complex processes ultimately with in built processes for managing the process knowledge and the process adaptation knowledge.** This effectively mandates the use of advanced process management IT support systems.

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[3] Wernerfelt B. 1984. A Resource-Based View of the Firm. Strategic Management Journal 5: 171-180

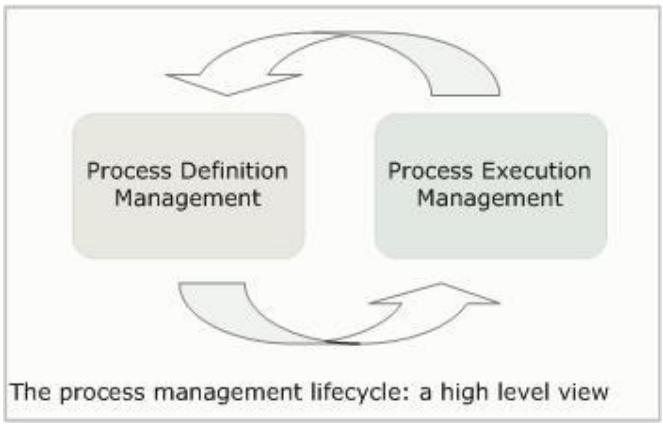
Wernerfelt B. 1995. The Resource-Based View of the Firm - 10 Years After. Strategic Management Journal 16(3): 171-174 .

[4] Developing advantage-creating knowledge assets

Today, Process Management systems have evolved to their so-called third generation, but so have their requirements (see Annex 2) Workflow systems[5] now need to be deployed in various scenarios, ranging from human-cantered organizational processes to autonomous software processes. These processes can be confined within organisational boundaries or extend beyond them. The distributed nature of internet provides new opportunities for dynamic and more flexible workflows. Robust, relatively low-cost automated tools support the new generation of business process analysis and modelling methodologies. Established standards include IDEF and workflow collision guidelines and BPEL for e-business process management.

5.1 Managing a Dynamic Business Process

Traditionally, there are two aspects of process management, namely, process definition management and process execution management. Process definition management has to do with analysis, definition (modelling), storage and management of different versions of process definitions. Process execution management is the ability to monitor and modify executing processes.



The process management lifecycle: a high level view

Currently, the process design stage consists of the documentation of the organisation's structure (e.g. business units, roles, personnel) together with the definition of the business process and associated rules. This design process culminates in forwarding the process definition information to workflow enactment software. As the workflow enacts, information relating to the commencement and completion of activities together with the time that transitions occur, exceptions to the process definition and status information is forwarded back to the workflow engine for further actions. Process measurements are fed back to the analysis stage and the cycle begins again, by adjusting or re-engineering the process definition.

To manage dynamic business processes the measurement and feedback needs to include specific adaptation triggering facilities and then the challenge is to automate the required changes to the

[5] The Workflow Management Coalition (WfMc) defines workflow as: "The automation of a business process, in whole or part, during which documents, information or tasks are passed from one particular participant to another for action, according to a set of procedural rules."

process definition, the testing and evaluation of proposed changes and the support for instantiating the new process definition.

Advanced simulation technologies could assist in several areas including:

- Identification of adaptation requirements or improvement opportunities;
- Evaluation of projected effect of alternative operational policies on performance (what if analysis)
- Comparison of alternative change design options.

5.2 The process knowledge perspective

Many key business process characteristics are dependent on knowledge issues, which in turn specify integration requirements for unified process and knowledge management. These key areas for process and knowledge interception are:

- **Process maturity** dictating the transition of processes from a defined stage to an optimised stage which takes years to achieve and can be only accomplished through efficient process knowledge development;
- **Processes are dependent on and supportive of human judgment** and therefore their effectiveness is highly dependent on the ability of the organisation to bring employees with the right expertise and experience to support specific process activities particularly in exceptional circumstances;
- Processes are often large and complex, involving the end-to-end **flow and transformation** of materials and information. The performance of each transformation can be only optimised if all the relevant information can be filtered, analysed and used in learning processes. Adaptation of transformation processes to changing circumstances can be only designed with confidence using system dynamics and simulation techniques;
- Processes provide **dynamic responses** to customer requirements and to changing market conditions. The accuracy of dynamic responses to complex influence factors depends on the ability of the company to create intelligent decision support systems;
- Processes are **widely distributed and customised across businesses boundaries**, often spanning multiple applications on disparate technology platforms- Both the flexibility and co-ordination efficiency of such processes relies on building experience on the performance characteristics of participants;
- Processes **automation** is normally maximised to increase speed and reliability and to minimise cost. The degree of automation can be increased by building knowledge on exceptions handling and intelligent support for situation assessment.

5.3 Process Knowledge development cycle

The business processes determine the detailed requirements for knowledge acquisition and dissemination. At the process design phase, knowledge limitations/gaps are identified and knowledge acquisition requirements are determined. When processes are operational, the

evaluation and user feedback processes establish new requirements either to improve process performance or to support process design changes.

6. Performance management

Process measurement and product measurements including customer feedback are used in the performance management process, the outcome of which guides three crucial development processes

- strategy refinement
- process improvement
- knowledge development

Performance management is the most common management activity performed traditionally through weekly or periodic reports and nowadays with Business Intelligence tools and applications. Often the performance management activity is not integrated with strategy and process management. This means that performance deviation leads often to decisions without taking into account the reasoning of the ongoing strategy or of the process design. Furthermore, the reasoning behind corrective actions is not documented and therefore cannot be reused in similar situations.

The performance management process is the essential mechanism for corporate knowledge development. For this performance monitoring should focus on

- establishing a clear assessment of which assumptions are correct and which are not;
- determining the reasons for performance deviations from targets and for differences across different business units
- identifying differences between customer perceptions on company's products and design objectives
- provide early warning of emerging patterns and trends that signify potential opportunities or threats

Refinement and optimisation of the business processes is based on actual measurement and experience gained by the enterprise reducing substantially the need for expensive and lengthy development projects.

7. The knowledge management process model

The knowledge management process model highlights the following four elements:

- Knowledge Management Strategy
- Knowledge acquisition and dissemination
- Training
- Knowledge development

7.1 Knowledge acquisition and dissemination

The knowledge acquisition component provides the following main functionalities:

- Maintains a list of knowledge requirements, their priorities and context;
- translates knowledge acquisition requirements in recruitment, training and learning related actions;
- Monitors acquisition actions;
- Maintains and qualifies the status of knowledge acquisition requirements;.
- Supports the dissemination of new knowledge according to organisational design parameters;
- Making available knowledge to individuals in such a way that they improve their capacity to act.

7.2 Training

The training programme provides the means to establish the corporate conditions for knowledge management as well as the means to develop the required skills and competencies. The training programme is an essential part of the knowledge development process that should enable the company to operate efficiently with optimum levels of productivity and effective decision-making.

7.3 Knowledge development

The central component of the knowledge management process is **knowledge development**. It provides the facilities for:

- Identifying 'who knows what' in the company particularly in specific corporate decision making or process activities;
- Converting personal knowledge into shared knowledge resources
- Developing knowledge from:
  - performance management;
  - customer interactions;
  - supplier interactions;
  - problem solving and decision making activities in the normal day to day work.
- Building a technical infrastructure ;
- Adding value to knowledge on a continuous basis increasing sustainable advantage.

Annex 1 A Classification of the Corprate Resource Pool

Source: Strategic Marketing and the Resource Based View of the Firm

Author	**Tangible Assets**	**Intangible Assets**	**Capabilities**
Wernerfelt (1989)	Fixed Assets	Blueprints	Cultures
Hall (1992)		Intangible Assets	Intangible Capabilities
Hall (1993)		Assets	Competencies
Prahalad and Hamel (1990)	Core Competencies		
Itami (1987)			Invisible Assets
Amit and Schoemaker (1993)			Intermediate Goods
Selznick (1957); Hitt and Ireland (1985); Hofer and Schendel (1978)			Distinctive Competencies
Irvin and Michaels (1989)			Core Skills

Tangible assets refer to the fixed and current assets of the organisation that have a fixed long run capacity (Wernerfelt 1989). Examples include plant, equipment, land, other capital goods and stocks, debtors and bank deposits. Tangible assets have the properties of ownership and their value is relatively easy to measure (Hall 1989). The book value of these assets is assessed through conventional accounting mechanisms and is usually reflected in the balance sheet valuation of companies. The other defining characteristic of tangible assets is that they are transparent (Grant 1991) and relatively weak at resisting duplication efforts by competitors. For example, though plant or land may be geographically immobile, they are relatively imitable and substitutable.

Intangible assets include intellectual property such as trademarks and patents as well as brand and company reputation, company networks and databases (Hall 1992; Williams 1992). The presence of intangible assets account for the significant differences that are observed between the balance sheet valuation and stock market valuation of publicly quoted companies (Grant 1991; Rumelt 1987) such as in the pharmaceutical sector where patents are critical. Intangible assets have relatively unlimited capacity and firms can exploit their value by using them in-house, renting them (e.g., a license) or selling them (e.g., selling a brand) (Wernerfelt 1989). They are

relatively resistant to duplication efforts by competitors. Intellectual property is afforded regulatory protection (Hall 1992) while databases, networks and reputation are examples of asset stocks (Dierickx and Cool 1989) and the inherent complexity and specificity of their accumulation hinders imitability and substitutability in the short run.

Capabilities have proved more difficult to delineate and are often described as invisible assets (Itami 1987) or intermediate goods (Amit and Schoemaker 1993). Essentially capabilities encompass the skills of individuals or groups as well as the organisational routines and interactions through which all the firm's resources are co-ordinated (Grant 1991). Typical of the latter, for example, are teamwork, organisational culture and trust between management and workers. Capabilities do not have clearly defined property rights as they are seldom the subject of a transaction (Hall 1989) resulting in a difficulty in their valuation. They have limited capacity in the short run due to learning and change difficulties but have relatively unlimited capacity in the long run (Wernerfelt 1989). Individual skills may be highly tacit making them inimitable and non-substitutable though as noted earlier they may be hired away by competitors. Where capabilities are interaction-based, they are even more difficult to duplicate due to causal ambiguity and the RBV literature has tended to favour capabilities as the most likely source of sustainable competitive advantage (Collis 1994).

Annex 2 Work Flow evolution

Generation	Major Characteristics
First	***Application specific*** • Workflow capabilities expressed in particular applications (e.g. image, document management) • Hard coded process definitions • Closed and proprietary
Second	***Factored application*** • Workflow capabilities factored out of from application domain • Workflow as a separate application • Limited selection of third-party tools • Process definitions tailored through scripting languages
Third (current)	***Tailorable service*** • Generic workflow services accessible to other applications through APIs • Open, standards-based architecture • Full integration with third-party tools • Tailorable through GUIs • Proprietary workflow interfaces and interchange formats
Fourth (next)	***Embedded enabler*** • Workflow services fully integrated with other middleware services (email, desktop management, directory) • Standardised interfaces and interchange formats • Workflow-enabled applications • Ubiquitous but invisible

Generations of Workflow Technology [Abbott97]