Chapter 1

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Chapter Overview

This chapter presents a review of Knowledge Management and Knowledge Capital. It has been organized into four sections. The first section presents introduction to Knowledge Management and Knowledge Capital. The second section deals with India and Knowledge Capital. The third section discusses Knowledge Capital and Indian Public Sector. The chapter ends with a Justification of Research section.

1.1 Knowledge Management and Knowledge Capital

The following section discussed different aspects of Knowledge Capital / Intellectual Capital, importance of it’s management and it’s valuation

1.1.1 Concept of Knowledge Capital

The concept of knowledge capital gained popularity in the 1990s with the rapid emergence of information and communication technologies. Soon it began to be considered more important for the success of an organization than physical capital. Consequently, both public and private sector organisations started attributing their business value to intangible, knowledge-based assets. On the other hand, traditional measurement systems of accounting were not sophisticated enough to value these intangible assets. Thus, the past about one and a half decade realized the importance of intangible assets in the operation and valuation of organizations resulting in new ways of management and evaluation of performance. As a result of this development, human resources are treated as assets to be invested in, deployed, and developed carefully, and not as costs on profit and loss statement. Knowledge Capital (KC) or Intellectual Capital signifies that information is an important factor of production along with land, labour, capital and energy.

KC is the prime source of an organisation that needs to be sustained, nurtured and accounted for. Human capital comprises individual talents and knowledge that is acquired through education, training, experience and cognition. Natrajian (2000) has beautifully explained, “Knowledge capital is the documented knowledge that is available in such forms as research papers, reports, books, articles, manuscripts, patents and software. Knowledge capital consists of artifacts of the human mind that
are stored outside the minds of their authors and are therefore available to whoever seeks them”. “Knowledge capital is the net difference between the market value of a corporation and its tangible assets” (Strassmann, 1999). The essence of knowledge capital is not in its creation or codification; it is in its use and realization of goals and aspirations. Knowledge created and codified is worthless until after it is put to use and people benefit from its use. Developing a new process is useless until after the process leads to a realization of cost containment or improved quality. Intellectual property is of no value if it remains in the vaults of the intellectual property office. Knowledge capital for it to be of some value and worth must lead to realization.

Figure 1.1 Framework for Strategic Knowledge Management of Organizations

<table>
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<tr>
<th>Organizational Processes</th>
<th>Knowledge creation</th>
<th>Knowledge transfer</th>
<th>Knowledge utilization</th>
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<td>Organization Network</td>
<td>* Exploration * Tacit knowledge * Teamwork * Enabling conditions</td>
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<td>Human capital</td>
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<td>Structural capital</td>
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Source: Curado and Bontis (2007)

The full cycle of knowledge capital must commence from inception or creation to realization. Realization is important if one is to focus on wealth creation. Knowledge capital that does not contribute to wealth creation is really doing work for nothing, or simply the epitome of gross inefficiency (Sveiby, 2007). It can be concluded that the collective knowledge capital of an organization is represented by the skill and
experience of its employees as also by its corporate information repositories. It is a very reliable indicator of the future earning potentialities or net worth of a company.

1.1.2 Knowledge Capital / Intellectual Capital

Knowledge Capital is defined as intangible assets of an enterprise that are required to achieve business goals, including employee’s knowledge; data and information about processes, products, customers and competitors; and intellectual property such as patents or regulatory licenses. Intellectual Capital is also called by the name of “Knowledge Capital” or just as intangibles (Banerjee, 2012). To a large extent, management value-added depends on the level of “knowledge capital”—a term Strassmann (1999) coined to denote the value of accumulated knowledge held by employees. Ultimately, this accumulated knowledge, and the increase in working efficiency that comes with it, increases the total value of products or services a company is able to produce.

The concept of Knowledge Capital, used synonymously with Intellectual Capital (Guthrie, 2000) has been defined by practitioners and academics across a variety of communities and disciplines including Strategy, Accounting and Reporting, Performance management, Human Resource management, Research Methodology and Valuation, but as yet there is no agreed method of measurement to it. Knowledge /Intellectual capital has been conceptualised through a number of disciplines, such as management, organisational learning, accountancy, evolutionary economics, R&D management, IT management. Accountants are interested in measuring it in the value of the organisations and technologists want to codify it in systems. Human resource managers and training and development officers want to make sure they build on it and get return on the investment. The concept has multiple perspectives depending on the discipline from which it is approached. However, what is common is that the changing nature of the current economy, depended more on intangible knowledge based resources, has necessitated the growth of interest in the concept (Petty & Guthrie, 2000). Leif Edvinsson(1999), Nonaka & Takeuchi(1995) suggest that knowledge (intangible intellectual capital) is constantly being developed in organisations in the course of daily business. Knowledge capital is defined by these
authors as the shared context/environment, inclusive of physical, mental, virtual, where knowledge is created through the facilitated interaction of tacit and explicit knowledge (Edvinsson 2002, Nonaka & Takeuchi 1995). Roos(1997) defines intellectual capital of an organisation as the invisible processes and assets of the company and classifies them into “thinking” human capital and “non thinking” structural capital (Roos,1997). The former needs different management strategies, which it derives from external and internal relationships, structural and systemic routines and processes that help deliver routine tasks. Knowledge Capital also known as intellectual capital is defined as inputs and outputs of the knowledge creating process and the enabling conditions conducive to this process (Umemoto.K. 2002). Individual learning becomes group knowledge only when shared and legitimized through dialogue and shared understanding like between clinicians, patients and administrators. For instance, in healthcare the quality and safety of service provision is dependent on the competence for learning and reapplying of knowledge gained from experience. While experience and expertise is the grounding for this capital, organisations provide the physical, social and resource allocation structures to leverage the human element into capability and capacity (Teece, 2006). Policy, published literature does not yet recognise this interdependency except in the clinical academic joint performance management report.

Business today is defined as an organization that adds value and creates wealth. The Activity Based Costing (ABC) and Earned Value EVA, progress was achieved in controlling information of business activities. This is seen as the beginning of a shift from costs to value creation. The introduction of the concept of value added met the essence of modern and future business activities of a company: the domination of input (costs) gave way to output (created value). However, the present accounting system, although improved by ABC and EVA, remains closely tied to capital employed and financial capital flows, still lack relevant information on the performance of intellectual capital. As opposed to this, a new measuring system for corporate success focused on value creation, value creators and value creation activities and processes. Companies is finding ways of identifying and leveraging the existing intellectual capital, as well as creating new intellectual capital. Systematic
managing and permanent measuring of a company's intellectual capital performance enable companies to sustain in the long-term.

Enron who was sixth (Fortune,2002) place was no longer exists now. Many companies not in existence now due to erosion of knowledge capital like Enron and World.com, partially AOL etc. Back home, Silverline Software, Mining and Allied Machinery Corporation, Metal Box are also not in existence now due to the same reason. There is no doubt that the traditional indicators of business success, such as increase in total income, profit or cash flow, do not reflect the real business capacity of a company. Moreover, these indicators do not reveal whether companies create value or not, as one can talk about value creation only if a company is creating more than it has invested in resources, capital employed (physical and financial) and intellectual capital. This “gap” is generated by new modes of value creation and outdated evaluation of business success. The existing criteria for business success, revenue and profit, do not cover the performance of intellectual capital, the key value creation factor of modern business.

In this context, the ability of employees to transform their knowledge and skills into actions that create value is crucial. It is almost impossible to measure “knowledge and ability” of a company per se, but it is possible to measure the results of applied knowledge, the achieved value added, and the efficiency of this value creation. Practice has shown that information gained by measuring value creation efficiency can be essential for successful management of intellectual assets.

1.1.3 Knowledge Capital Model

In order to remain viable, an organization has to create value and grow its financial performance on a sustainable basis. In the knowledge era, our belief is that the best way to attain breakthrough performance is by building a conductive organization where sustainable financial capital growth is based on the organization's ability to grow its customer capital. And customer capital generation requires that the organization’s structural and human capital is fully aligned to value creation at the customer interface.
The following literature describes how one capital dimension interacts with another and how they interact holistically through what one call the Knowledge Capital Model.

**Figure 1.2 Types of Assets in an Organization**

![Diagram of types of assets](image)

Source: Kuo and Wu (2008)

The Knowledge Capital Model (see Figure 1.3) provides a new perspective for managing the intangible assets in an organization—for systematically developing, maintaining, leveraging, and renewing them. An organization creates value when individual employees interact with customers. The quality of these relationships will determine the effect on the organization’s customer capital. The structural capital interacts directly with customer capital but also serves mainly as the platform from which human capital can increase the value created for customers.
1.1.4 Knowledge Capital & it's Valuation

Groups and individual knowledge capital has great potential. It can achieve almost anything in this era. It is said to be the future of this century and one would witness its amazing performance and would overshadow every activity including commercial one. Therefore, it should get place in the financial statements. The reason for not including knowledge capital in financial statements is due to money measurement concept. So the solution lies in finding a way of its measurement i.e. accounting of knowledge capital. There is a growing need to raise knowledge capital because:

- KC has the power to influence profitable existence of an organization.
- KC is needed for collaboration contracts and its implementation.
- KC is needed for carrying amalgamation and mergers.
- KC has the capacity to build brand.
- KC is the basis for other forms of capital.
- KC makes high quality and international mobility possible.
It has great analytical power and it has given it an extra edge over any other form of capital. This analytical power leads to new technologies, strategies, policies, principles, tactics etc. Understanding something and understanding it properly and then finding out way to work with it has made this capital great.

1.1.5 Methods for Valuation of Knowledge Capital

There are various methods of valuation -

- Historical Cost Method
- Replacement Cost Method
- Opportunity Cost Method
- Behavioural Method
- Economic Method
- Value Added Intellectual Coefficient (VAIC)

Historical Cost method was proposed by Brummet et al. (1969) to measure a firm's investment in human resources. The method suggests capitalizing the firm's expenditure on recruitment, selection, training and development of employees and treats them as an asset for the purpose of human resource accounting. Replacement Cost Method involves assessment of replacement cost of individuals, and rebuilding cost of the organization to reflect human resource asset value of both the individuals and the organization. Opportunity Cost Method involves the computation of monetary value and allocation of people to the most promising activity and thereby to assessing the opportunity costs of key employees through competitive bidding among investment centers. Behavioural Method is a set of casual variables through psychosocial test results reflecting the appreciating or depreciating condition of human organization as reflected by a set of intervening variables, which in turn, are likely to result in the achievement of the end result variables. Economic Method advocated by Lev & Schwartz (1971) is the estimation of future earnings during the remaining life of the employee and then arriving at the present value by discounting the estimated earnings at the employee's cost of capital. The method has been widely adopted by Indian companies like Infosys, BHEL and SPIC etc.
1.1.6 Elements of Knowledge Capital
Although some researchers define intellectual capital differently and specify some more constitutive elements, it has become standard to say that a company’s intellectual capital is the sum of its human capital (talent), structural capital (intellectual property, methodologies, software, documents, and other knowledge artifacts) and customer capital (client relationship). Every company has all three, but some emphasize one more than the others (Stewart, 1994).

For this purpose these three major elements of intellectual capital are observed and defined separately:

1. Human Capital – the first element that is defined as the force behind the human intellect and innovation of the firm.
2. Structural Capital - the second element (also called organizational capital) allows the creation of wealth through the transformation of the work of human capital.
3. Customer Capital – is the third major element of intellectual capital (also called clients or relational capital). It is defined as the ability of the firm to interact positively with business community members to stimulate the potential for wealth creation by enhancing human and structural capital.

Human capital represents the capability of individuals to provide solutions and to export the innovations and improvements, by researching in laboratories or by managing the company. But smart individuals do not necessarily lead to a smart company. For example, McDonald’s, whose employees have only average IQs, has a very intelligent organization capable of producing the same quality despite multicultural differences. They have modulated and standardized their knowledge into top-quality structural capital (Stewart, 1994). Dividing and transferring knowledge requires structural intellectual assets, such as information systems, laboratories, competitive and market intelligence, knowledge about market channels and managerial capability that transforms individual know-how into the property of a group. Transforming human knowledge into structural capital enables companies to involve themselves more quickly in global trends and the global market.
Customer capital represents the value of the relationship with the people with whom the company does business. This is the possibility that the clients will continue to work with the firm. Customer capital can be extended to relations with suppliers. However, whether these relations are upstream or downstream, the aim of business are always the same. The immeasurable part of customer capital appears in many non-financial forms. Most important, it is obvious in success and trust. When companies make decisions in buying a new machine, the quality of the relationship with each company has the same role as the price and technical specifications. In today’s global economy, these relationships have the dominant role in a decision making process. The better these relationships are the more likely is the buyer to share his plans and expertise with the seller and obtain mutual success. Knowledge compiling and cooperation with clients is the highest form of relational capital. Finally, intellectual capital is not created from discrete bundles of human, structural and customer capital, but from the interpolation among them. Structural capital formed of databases, computer networks, patents and good management can augment the talent of an engineer while bad tools and bureaucrats can devalue it. If the human capital in the form of top experts does not communicate with the customer capital, the result will be negative. The interaction of all elements of intellectual capital represents a process of value creation.

1.1.7 Models of Knowledge Capital

Brief descriptions of some of the important contributions of the early exponents of the subject are as under:

Karl-Erik Sveiby’s Model

Karl-Erik Sveiby, a Professor at Macquarie Graduate School of Management in Sydney, is regarded as the founding father of knowledge management and intellectual capital movement in Sweden. Sveiby (1989) gave a logical explanation about the management of the organizations that had only knowledge and creativity of their employees but no traditional production (Sveiby, 1989). He was the first to identify the need to measure human capital, and he developed an accounting model for this intangible capital, testing it in his own company. He proposed a theory for measuring
knowledge capital by dividing it into three categories: customer capital, individual capital, and structural capital (Sveiby, 1989). A large number of Swedish companies adopted Sveiby's approach and in 1993, the Swedish Council of Service Industries also adopted it as their standard recommendation for corporate reporting. There are 34 intangible assets measuring methods at present.

Figure 1.4. Methods for Knowledge Capital Measurement

His model provides a comprehensive and integrated view of financial as well as intellectual capital. Generally, it is the hard quantitative data that is used as indicators for scrutinizing the internal and external processes taking place in a country. However, this model declared that such indicators failed to provide full and accurate assessment of the country's assets and its potential for future growth. He described intellectual capital as a complement of financial capital. According to the model, financial capital highlights the history and achievements of the past of a country; the intellectual capital reflects its hidden national potential for future growth.
Paul A. Strassmann's Model
Paul A. Strassmann laid emphasis on the value of corporate knowledge. According to him, knowledge capital is nothing but creative energy which springs forth from something that is intangible, as if it were an artistic conception. It ultimately leads to management value addition. It is because of this value addition that market value of a company is different than its book value. Apparently, management value-added depends, to a large extent, on the level of knowledge capital. This accumulated knowledge increases work efficiency which ultimately increases the total value of products or services of a company.

Kaplan and Norton's Model
Kaplan and Norton rejected the traditional financial reporting calling it too narrow in its outlook. They averred that it ignored the future and focused only on present and past. They suggested that the companies should use a 'balanced score card' that included besides the traditional financial measures, other things such as customers satisfaction and turnover, comparative product quality as these things were better indicators of current performance and likely future performance. They opined that intellectual capital must be a part of the balanced scorecard.

Baruch Lev's Model
Baruch Lev, who started his research in the early 1990s on the valuation of intangibles, focused on quantifying the value of intangibles and correlating the values so obtained with financial measures adopted in the capital markets. He opines that the traditional accounting model which recognizes only tangibles assets and focuses only on legal transactions while ignoring other value changing events was not appropriate to deal with the new economic environment. He asserts that it no longer meets the needs of the managers and investors of the present times. He presented an improved GAAP; double-entry system based on the economic definition of an asset as Financial-Economic Capital and an information system aimed at capturing the links between resources and outcomes as Non financial-Path Matrices. These three orbital systems are integrated into a coherent information structure through control links.
VAIC (Value Added Intellectual Coefficient)

Stewart (1991) defined IC in his research study as: “The sum of everything everybody in your company knows that gives you a competitive edge in the market place. It is intellectual material - knowledge, information, intellectual property, experience - that can be put to use to create wealth”. Introducing the notion of intellectual capital into business was a considerable step forward as it represented the beginning of a new age with focus on the employees, knowledge and intellectual assets as an essential presupposition for knowledge based economy. In order to become an integral part of business the concept of IC required adequate measurement techniques.

The VAIC analysis is based on two key resources in each business, Capital Employed (physical and financial capital) and Intellectual Capital. Both are treated equally as investments and both are in the function of value creation. The human capital of a company consists of all employees, their organization and their ability to create value that is evaluated at the market. A company can have the best qualification structure, i.e. intellectual potential, but if it creates little value with regard to its resources, its intellectual ability is low. Therefore, in order to get a full and objective picture of business success, it is necessary to monitor not only the performance of Capital Employed, but also the performance of Intellectual Capital, particularly the human component.

Two key resources, Capital Employed (CE) and Intellectual Capital (IC), create the value added. In order to calculate the efficiency of their value creation, each of these resources is related to the achieved value added. Thereby one gets the efficiency indicators: CEE – Capital Employed Efficiency, HCE – Human Capital Efficiency and SCE- Structural Capital Efficiency. By adding up the efficiency indicators, the result is VAIC (Value Added Intellectual Coefficient), which is an indicator that reflects the company’s “total efficiency” or its “intellectual ability”. The higher this indicator the better management has utilized existing potential. The benefit of this measuring method is that it is focused on value creation and not cost control and it takes IC, particularly HC into account. It is considered human capital to be the driving force
of value creation in the new economy, it is a key resource and therefore its ability to create value has to be measured and monitored.

VAIC is a management and control tool that is designed to enable the organizations to monitor and measure the IC performance and potential of the firm. It’s formula is very simple and straight-cut to calculate. It takes data mostly from Audited Annual reports of the firm which is very authentic and regular in fashion. It uses only one indicator VAIC which is very helpful to compare firms. It takes care of both intellectual capital and financial performance which help in combining two distinctive discipline of finance and performance measurement (Pulic, 2000 and 2002).

1.2 India and Knowledge Capital
The following section depicts importance of Knowledge Capital in India.

The world is fast changing from an industrial to a knowledge economy. The economic growth engine in UK was textiles, in USA it was the industrial revolution led by the railways, timber and timber products led to Sweden’s take off and in Denmark the same was done by milk and dairy products. India had struggled to find its leading sector over the last sixty years and now it has found it in the knowledge sector of economy. Large number of Indians working successfully in the Silicon Valley is evidence to it. Indian knowledge workers have a clear cost advantage also. Companies like TCS, Infosys, Wipro, HCL, Bharti Telecom, ICICI bank, HDFC bank, Insurance companies etc. are creating lots of new jobs in service sector. In recent years, India is being seen as the emerging laboratory of the World and, no doubt, today, it is a country where high-tech companies from all over the world have set up their research and development centres and the process is continuing. India is turning to be a global centre for the back-office operations of several multinational companies. The software industry in India exports software and services to nearly 95 countries around the world and more than two third of Fortune 500 companies outsource their software requirements to India. If cost is what brought companies to India, quality is what is making them stay and expand. India is on the threshold of becoming a knowledge superpower because one of its strongest assets as a nation is the inventiveness and creativity of its people. But India does not have any valuation system for this most
important resource of the country. Seeing the growing importance of the concept, the
government of India has constituted National Knowledge Commission under the
chairmanship of Sam Pitroda. It is expected that the recommendations of the
commission will ultimately facilitate far-reaching changes in the field of governance,
education and research. However, as far as the measurement and valuation system is
concerned, nothing concrete has been done so far. It has not been able to develop any
accepted and recognised model to implement human resource accounting which is the
first step in the direction of measurement of knowledge capital. It is also to be noted
that the efforts at the global level are also more of theoretical and conceptual nature
and are not sufficient to replace or amend the old established system of double entry
system of accounting.

1.3 Knowledge Capital and Indian Public Sector

The following section illustrates possession of Knowledge Capital by Indian Public Sector

In this research, the researcher is focussing on the Public Sector Enterprises (PSEs)
which are listed at Bombay Stock Exchange (BSE). If 51 percent or more of the paid-
up share capital of a company is held by the Central Government and/or any one or
more State Governments, the company becomes a Public Sector Enterprises. PSEs
grew up to occupy commanding heights in the Indian economy and still continue to
contribute greatly to the growth of India's economy. This can be judged from the fact
that there are seven Indian Companies in the Global Fortune 500 list for 2009. Out of
these seven companies, five are PSEs and only two are private corporate (Fortune,
2009). It is a matter of great pride that the top ranking company today is a PSE and
that too in a liberalized scenario when most of the areas are open to private
investment. However, many PSEs are also known for its inefficiency, non-
performance, inability to innovate, to name few like HEC, Scooters India Ltd. Etc.
Such arguments at times stretch to the extent of questioning the very existence of the
PSEs. At the end, privatization or disinvestment of PSEs is considered a panacea for
all the ills afflicting the PSEs. Today, even after partial dis-investment PSEs have
emerged as major wealth creators for investors and stakeholders. This is evident from
the fact that about 61 listed PSEs comprised about 30 percent of the BSE market
capitalization (as on July 24, 2009). The PSE market capitalization for financial year
2007-08 recorded a growth of 65 percent over the financial year 2006-07 market capitalization. This is much higher than the 45 percent increase registered in total market cap of BSE in the same period. Clear defined measures must be laid down to assess knowledge capital of PSEs. These measures will enable PSEs to compete successfully in a market-driven environment. Performance evaluation of knowledge capital management is one such measure.

The primary objective of this study is to evaluate the performance of Knowledge Capital of the Public Sector Enterprises in India so that ordinary shareholder’s earning is maximised. The study is based on the argument that the shareholders earning is an outcome of Knowledge Capital efficiency.

1.4 Justification of Research
The following section briefly discussed justification of this study.

There is a global consensus about the objective of ‘good’ corporate governance: maximising long term shareholder value. Since shareholders are residual claimants, this objective follows from a premise that, in well performing capital and financial markets, whatever maximises shareholder value must necessarily maximise corporate prosperity, and best satisfy the claims of creditors, employees, shareholders, and the State. The model Value Added Intellectual Capital Efficiency (VAIC) is an indicator combing both physical capital and intellectual capital. If the Indian Public Sector’s performance is evaluated on the basis of VAIC and it’s relationship with Earning Per Share (ultimate gain of shareholders) is established then more investors would invest in these companies by judging their performance. Also, it can would help policymakers in valuation of a Public Sector Enterprises for any future divestment.