

MANAGING HUMAN CAPITAL IN THE KNOWLEDGE ECONOMY

— PERSPECTIVES FROM THE FIRM AND THE INDIVIDUAL —

by

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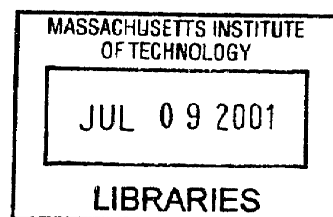
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ABSTRACT

This thesis examines the challenges and implications of managing human capital in a knowledge-intensive environment from the perspectives of both the firm and the individual. Knowledge is redefining the operating environment and competitive landscape for individuals, businesses and nations. The knowledge economy that has emerged is one that is differentiated by the characteristics of speed, connectivity, complexity, continuous learning and intangibility. The knowledge assets of a firm is the aggregate of its human capital, structural capital, customer capital and the value that the interaction of these components produces. As firms transition into the knowledge economy, their primary challenge will lie in developing the ability to recognize, capture and exploit the value of knowledge assets.

The Human Capital Management Model provides a framework for examining and integrating the broad range of issues surrounding human capital management. By taking an approach that involves reshaping the entire firm, the model suggests that a firm progress through six stages in the build up of an infrastructure for sustained human capital development. Each stage is correlated with higher returns from human capital. The six stages involves assessing and differentiating human assets, re-organizing work, recasting and understanding new roles, putting in place a performance measurement and reward system, enhancement and growth through continual investments, and lastly establishing trust as the basis for integration of human, structural and customer capital.

The same forces that are reshaping the way that firms manage their human capital will impact how an individual views his own career and its management. First, careers are repositories of knowledge. Next, continuous learning is the primary means for renewal and upgrading of human capital. Third, career management is a series of risk management choices, where the rate of return determines the range of future choices. Finally, individuals will assume the primary responsibility for career direction and progression.

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CHAPTER 1

THE KNOWLEDGE ECONOMY

“Knowledge has become the primary ingredient of what we make, do, buy and sell. As a result, managing it – finding and growing intellectual capital, storing it, selling it, sharing it – has become the most important economic task of individuals, businesses and nations.” Thomas Stewart in *Intellectual Capital, The New Wealth of Organizations*.

1.1 TRACING THE EVOLUTION

The concept of a post-industrial society emerged in the mid-1970s, postulating the growing importance and contribution of services over manufacturing as an economy develops and advances.¹ In the service-centric economy, knowledge, rather than capital, labor or materials, becomes the core factor of production and source of sustained economic growth. Employment trends in the G7 countries over this period have largely borne out this concept as growth in services employment outpaced manufacturing. In the US, an average of two million new jobs per year in the services sector have been created in the last four years while manufacturing employment remained stagnant and has in fact started a gentle decline.²

In practice, however, distinguishing the service sector from manufacturing has been highly problematic. For instance, a movie can be delivered both in the form

¹ A Touraine (1969), *La Societe post-industrielle*, Paris: Danoel D Bell (1973), *The Coming of Post-Industrial Society*, New York.

² International Labor Office. *Bulletin of Labor Statistics 2000-3*. Geneva.

of a good as in a video tape or CD; or at the cinema as a service. Or consider the software that is embedded in a piece of machinery. It not only enables the automation of a human process but has the additional ability to generate new information about the underlying process that can lead to the creation of new knowledge. In both cases, segmenting the output (movie and machinery) as either service or manufacturing fails to accurately and fully capture the value that was created from the production of the product. As both manufacturing and services become increasingly information-intensive, the distinction becomes even more blurred.

This convergence of product and service has helped to propel knowledge to the forefront. Knowledge is the intangible element that adds value to both products and services, making it vital to firms.

- **Information technology as enabler**

At the heart of this transition into what is now widely called the knowledge economy is the role of information technology (IT). IT has completely transformed the way that information is handled and the amount of information that can be processed. In addition, its impact has been magnified many-fold by a combination of its declining cost curve and improving performance curve.

The application of IT has facilitated the development and transfer of knowledge by breaking down complex processes into simpler, more general units that can

be stored, accessed and re-assembled. In so doing, IT has unleashed the intrinsic value that knowledge creates and this value can be leveraged for growth.

While knowledge has grown in importance, the difficulty of tracking it due to its multitude of different forms implies that we are still in the early stages of understanding the role that knowledge plays in the economy. As early as 1962, an attempt to measure the economic value of knowledge production by Fritz Machlup³ concluded that 34.5 percent of the US Gross Domestic Product could be allocated to the information sector. Subsequent work post-1980 estimated that the knowledge industry was 36.5 percent of US GDP. While these estimates may not be conclusive, they clearly point to the already significant and increasing contribution of knowledge in today's economy.

1.2 UNDERSTANDING THE KNOWLEDGE ECONOMY

▪ Knowledge and its management

A closer look at the new knowledge economy first requires an understanding of what knowledge is. Knowledge is both an economic resource as well as an output. As knowledge takes center stage, its characteristics introduce a different and new set of issues that impact individuals, companies and the economy.

³ Fritz Machlup. *Knowledge : Its Creation, Distribution and Economic Significance*. Princeton University. 1962.

What sets knowledge apart are some unique characteristics. Firstly, it does not have a specific physical or tangible form. Its intangible form makes it difficult to track or measure. Second, knowledge is contextual. It needs to be tied to particular viewpoints and intentions. Otherwise, it has little or no value. Third, knowledge can be leveraged over and over without loss of value. When a person shares knowledge, the value of that knowledge is not diminished. While many people view knowledge as power and may have personal reasons for withholding it, this loss of political leverage is seen from the perspective of the individual. Fourth, knowledge can be leveraged at a much lower cost than financial or physical capital. This means increasing returns and lower costs of entry. Lastly, knowledge has the ability to create value and hence wealth. It is this last attribute in particular that makes the management of knowledge critical.

1.3 A NEW OPERATING ENVIRONMENT

Knowledge is redefining the operating environment and competitive landscape for individuals, businesses and nations. Signs of its impact on the economy are increasingly evident. In his testimony before the US Senate on January 25, 2001, Chairman of the Federal Reserve Board Alan Greenspan pointed to the accumulating evidence that there has been a structural upward shift in productivity growth rates that can no longer be considered transitory. "Between the early 1970s and 1995, output per hour in the non-farm business sector rose about 1-1/2 percent per year, on average. Since 1995, however, productivity

growth has accelerated markedly, about doubling the earlier pace, even after taking account of the impetus from cyclical forces.”⁴

At the risk of oversimplification, the major shifts that underlie this structural change in productivity growth can be summed up in three key observations.

- **Towards the intangibles**

Economic activity is shifting from the production and handling of physical goods to the handling of information and creation of knowledge, succinctly described by Negroponte as moving “from atoms to bits.”⁵ Money is often cited as an example to illustrate the phenomenon of de-materialization. From objects to precious metals to paper and coins to plastic cards, monetary tokens have been progressively replaced by electronic symbols. Most funds are now electronically stored, exchanged and controlled. As a result of electronic banking, retail banking is now far less central.

- **Traditional boundaries are disappearing**

The ability of electronic data to represent a wide variety of topics and its handling efficiency make possible massive economies of scale. As a result, traditional boundaries have given way and the era of globalization is well underway. Firms increasingly outsource labor, production and any other activities that are

⁴ Testimony of Chairman Alan Greenspan before the Committee on the Budget, US Senate. *Outlook for the federal budget and implications for fiscal policy*. January 25, 2001. <http://www.federalreserve.gov/boarddocs/testimony/2001/20010125/default.htm>

⁵ Negroponte, N. *Being Digital*. New York. 1995.

considered non-strategic. Electronic commerce is facilitating the global trading of goods and services. This new platform has dramatically increased the speed at which business can be conducted, and redefined the way business networks are built and how they function. The emphasis on building and enhancing telecommunications infrastructure by governments and firms around the world is proof of their understanding of this new environment, where connectivity is key.

- **Growing price premium on education**

As productive activities rely more and more on knowledge, the premium on education and continuous learning grows. Learning provides the means to renew and increase knowledge capital. Both individuals and firms realize this. It is no surprise then that e-learning is projected to be one of the fastest growth sectors on the internet.

In sum, the features that differentiate the knowledge economy are :

- **Intangibles**, where the virtual has more value than the physical
- **Speed**, where constant change is rapid and a sign of good health
- **Connectivity**, where open systems thrive and in turn create a high level of interdependence
- **Complexity**, where a multidisciplinary approach is the basis for innovation
- **Continuous learning**, an essential competence for both individuals and firms

These changes will bring about new, exciting challenges and opportunities. For firms and governments, the impact and momentum of these changes are well underway. For the individual, the new economy hits home through the wealth creation process, in how it is changing the way that wealth is created, accumulated, distributed and controlled. “Traditionally.... the economy drove the market. Now the opposite is more and more the case.”⁶ In the creation process, the shift is from real to financial, where the financial dimension refers to the creation of wealth by bearing, trading and managing risks; as opposed to the production of goods and services in the real economy. Similarly, wealth accumulation emphasizes what is unearned. The net worth of an individual, comprising his/her skills, know-how and assets overtakes his/her earned income in terms of importance. Net worth itself becomes a source of wealth rather than an outcome. As a result, middle class wealth not only exists but is growing, implying a broader distribution of wealth that accompanies the distribution of knowledge. Finally, the control of wealth shifts from the institution to the individual. Driven by the availability of information and open access, individuals can exercise far greater control over their own economic future.

The objective of this thesis is to examine the implications of managing human capital in a knowledge-intensive environment from the perspectives of both the firm and the individual. Possible approaches to this challenge are also outlined, from the two separate perspectives of firm and individual. This chapter provided

⁶ Louis Uchitelle, “Greenspan Ties Debate on Rates to the Markets”, *New York Times*, 28 August 1999. <http://www.nytimes.com/>

the backdrop by outlining the evolution of the knowledge economy and examining the characteristics of this new competitive environment. Chapter 2 considers the implications of the new economy for the way firms grow and the challenges they face in the transition stage. It also attempts to define the elements of a firm's knowledge assets, by separating the three components of human capital, customer capital and structural capital. Chapter 3 proposes the use of a framework to examine and integrate the range of human capital management issues confronting a firm as it makes the transition into a knowledge firm. Finally, Chapter 4 adopts the perspective of an individual in examining the same issue of human capital management and reflects on the implications for managing career growth and progression.

CHAPTER 2

REDEFINING THE CORPORATE CONTEXT

2.1 FIRMS IN THE KNOWLEDGE ECONOMY

Firms are often seen as a collection of productive resources that are both tangible and intangible. These resources determine the firm's core competencies, its competitive strategies and growth. The firm's management has the responsibility to organize and leverage these resources, with the objective of generating superior returns to the firm's owners or shareholders in the case of publicly held firms. We have come to accept that firms are the *de facto* organizing mechanism for production, and the main source of jobs. However, as economic activities become more knowledge intensive, radical changes should be expected in terms of the status, role and structure of firms.

- **Knowledge intensity**

One current measure of a knowledge intensive company is the percentage of knowledge workers employed. A firm is generally considered knowledge intensive if close to half of its workers are knowledge workers. The set of defining characteristics of a knowledge worker are generally accepted to be: a high paying job with a professional orientation, work that involves a large informational component, greater use of mental rather than manual skills, and a higher level of education. 28 percent of US firms are knowledge firms but more

interestingly, these firms accounted for 43 percent of new employment growth in the decade from mid-1980 to mid-1990.⁷

Not all firms will be knowledge intensive in the new economy, even as the information content of work continues to increase. However, knowledge intensive firms will clearly have an impact that far outweighs that of other firms and they should play a leading role in the shaping of economic growth trends.

An important implication of knowledge intensity will be its impact on the firm's ownership structure. In knowledge intensive firms, workers will generally have high levels of specialized and/or tacit knowledge. This implies that the firm's value will increasingly be embodied in these individuals, raising the issue of who owns and controls this aspect of a firm's value, and how it should be appropriately assessed and recognized. This issue will be discussed in further detail in the next chapter.

- **Valuing knowledge assets**

In the last decade, there has been an increasing divergence between the tangible value of a firm as measured by its financial and physical assets, and its market value as reflected by the value of its stock. This is particularly true of knowledge intensive firms who are seen to be serious contenders in the new

⁷ The growth in service sector employment : Council of Economic Advisers with the US Department of Labor, *Job Creation and Employment Opportunities : The United States Labor Market 1993 – 1996*. 1996.

economy. Microsoft, for instance has a market premium of 7.7 times its book value, or a staggering \$370 billion (as at 27 April, 2001). The market premium of Microsoft reflects the value of its intangible assets and the market's belief that Microsoft has the ability to leverage these intangibles to create value and future growth.

Attempts at quantifying the value of intangibles have emerged in the last 5 years. In 1994, Skandia, a Swedish insurance group published— as a supplement to its annual report—what is seen to be the first report on intellectual capital (IC).⁸ Skandia believes that the “combination of business results and continuous strategic renewal with supplementary IC reporting allows the firm to reduce the risk premium formerly demanded by investors for their financial investment in Skandia, thus adding to shareholders' value.”⁹

Whether Skandia sets a trend for firms anxious to monetize the value of their intangible assets remains unclear, although there are advocates who believe that efforts have to continue “to determine what are the true and most useful drivers of wealth production for knowledge-based companies – to discover what, in fact, correlates with profitability, earnings and market share improvements in the future.”¹⁰ They believe that firms should be held accountable for intellectual

⁸ Annual supplements from 1994 to 1998 are available at <http://www.skandia.com/>

⁹ Leif Edvinsson and Ake Freij. *Skandia : Three Generations of Intellectual Capital*. Capital for Our Time. Hoover Institution Press. 1999.

¹⁰ Steven M H Wallman. *The Importance of Measuring Intangible Assets*. Capital for Our Time. Nicholas Imparato (Editor). Hoover Institution Press 1999.

assets just as they are responsible to their shareholders for the deployment of financial and physical assets for growth creation.

These trends clearly reflect a growing recognition by firms that as knowledge becomes the central productive resource, capturing and exploiting its value grows in relative importance. The notion that knowledge assets create value carries important implications. Firstly, these assets need to be defined so that metrics can be developed to track and monitor their development and performance. Second, they need to be managed in order that the value creation and extraction process will yield optimal returns. Whether knowledge assets should or can be managed separately from financial and physical assets is still a matter of debate. Third and probably the most important implication is that continuous investments in knowledge assets are needed. This ensures that a firm has the productive capacity to sustain growth in the long run.

Thus knowledge assets are aptly analogous to the roots of a tree. Its intangible character requires digging beneath the surface before it becomes visible. As the conduit for growth, it needs to be trimmed for managed growth and nurtured for sustained development. With time, commitment and proper care, it provides a solid foundation to support the tree as it flourishes and grows.

2.2 KNOWLEDGE ASSETS = HUMAN CAPITAL + STRUCTURAL CAPITAL + CUSTOMER CAPITAL

There are various definitions of what constitutes knowledge assets. Intellectual capital is often a term that is used interchangeably with knowledge assets. Skandia, a Swedish insurance group that is a pioneer in knowledge management defines the building blocks of intellectual capital as structural capital, organizational capital and human capital.¹¹ Karl Sveiby sees intangible assets as being made up of external structure, internal structure and people's competence.¹² While nomenclature may differ, attempts at defining knowledge assets invariably agree on several points.

First, human talent is the source of innovation and renewal. Second, some forms of structure and various mechanisms are needed to efficiently leverage human capital. These are often embodied in information systems, management systems and internal processes. Third, a way must exist to transform the human capital into financial gains that secure the ongoing survival of the firm. This is where the customer comes in and often the strength of a customer relationship becomes the overriding factor in ensuring sustainable growth. Fourth and last, it is the interaction of the three different areas mentioned above (human talent, systems, and capital transformation) that creates firm value.

¹¹ Skandia corporate website <http://www.skandia.com/>

¹² Karl-Erik Sveiby. *Intellectual Capital and Knowledge Management*. 9 April 1998. Article available on website <http://www.sveiby.com.au>

Worded another way, knowledge assets can be seen as the aggregate of human capital (talent), structural capital (systems and processes) and customer capital (relationships with customers) plus the value that the interaction of these components produces. It is worth mentioning here that from a practical standpoint, the management of these assets has meaning only when seen in the context of a firm's strategy, its organizational culture, and values.

2.3 TRANSITIONING INTO THE KNOWLEDGE ECONOMY : TRENDS AND CONSEQUENCES FOR THE FIRM

As firms transition into the knowledge economy, their primary challenge will lie in the management of knowledge assets. The firm's role and structures will need to evolve in response to the development trends of the knowledge economy. A successful transition implies that a firm will be well positioned to realize the full value of its knowledge, financial and physical assets.

Burton-Jones¹³ neatly sums up the major consequences for firms in the following table:

¹³ Alan Burton-Jones. *Knowledge Capitalism : Business, Work and Learning in the New Economy*. Oxford University Press. 1999.

Table 1 : Trends in the New Economy and Their Implications for Firms

	Trends	Major consequences for the firm
1	The principal functions of the firm will be knowledge co-ordination, protection and integration	<ul style="list-style-type: none"> ▪ Externalization of non-core functions ▪ Reduced investment in non-core assets (human, physical and financial) ▪ Reduced financial capital intensity ▪ Erosion of boundaries between internal functions, the firm and the market, industries and nations
2	Transactions involving high levels of specialized and tacit knowledge will be internalized	<ul style="list-style-type: none"> ▪ Higher entry level requirements for employment ▪ Increased cross-functional teamwork ▪ Increased emphasis on learning ▪ Increased performance-based incentives ▪ Greater dependence on key knowledge workers ▪ Development of knowledge management
3	Transactions involving high levels of explicit knowledge will be externalized	<ul style="list-style-type: none"> ▪ Reduction in average firm size ▪ Disintermediation of some physical channels ▪ Development of electronic markets ▪ Market contracts replace most employment contracts ▪ Careers replace jobs ▪ Increased inter-firm collaboration
4	Ownership and control of the firm will converge	<ul style="list-style-type: none"> ▪ Increased ownership participation for key employees ▪ Reduced need for external equity investment ▪ Increased number of privately owned firms ▪ Organizational restructuring within the firm
5	The links between education, work and learning will be redefined	<ul style="list-style-type: none"> ▪ Increased opportunities for high-skilled workers ▪ Decreased opportunities for low skilled workers ▪ Universal adoption of learning technologies ▪ Erosion of boundaries between academic and vocational training ▪ Convergence of academic and commercial interests

2.4 EVOLUTION OF KNOWLEDGE ASSET MANAGEMENT

In recent years, significant progress in knowledge management has occurred around managing structural and customer capital. Since the early 1990s, development in technology has supported the knowledge management movement as it evolved through different phases. The first phase was primarily focused on productivity improvement – how IT systems could be used to prevent reinventing the wheel. The use of project databases, best practices databases and groupware such as Lotus Notes took off. The next phase added a customer focus by looking at how firms can leverage what they knew to build more robust customer relationships. Data warehousing played a key role here. With the Internet, this phase took on the critical dimension of interactivity. Interactive web pages, e-business, on-line transactions, personalized information and services all point towards the potential for firms to unleash, create and extract high levels of value that could sustain growth.

On the other hand, the focus on human capital has been less urgent. An obvious reason is that labor markets tend to move more slowly than financial markets, whether due to human inertia or government-imposed restrictions. Human capital is also more complex relative to structural and customer capital. However, as the creation of future wealth becomes more dependent on the effective leverage of human capital, it becomes imperative that firms devote attention to the human capital component in the management of knowledge assets

The remainder of this thesis focuses on human capital in the context of knowledge intensive firms. It will build on the understanding of the new environment that defines the knowledge economy and the consequent challenges that firms operating in this new environment face.

CHAPTER 3

MANAGING HUMAN CAPITAL

3.1 THE HUMAN CAPITAL MANAGEMENT MODEL : AN INTEGRATED FRAMEWORK

The firm is being redefined by the dynamics of the emerging knowledge economy as it transforms into a leaner, smarter, flatter and more flexibly organized business. One way to understand this transformation is through the lens of the Knowledge Growth Model™ developed by Burton-Jones.¹⁴ This model proposes that a firm progresses through six stages of knowledge recognition, organization, networking, incentives, enhancement and enterprise. Annex A contains a detailed description of the model.

Within the strategic framework of a knowledge firm, the Knowledge Growth Model™ is designed to provide a practical and useful roadmap for systematically examining the challenges and issues that a firm needs to address and resolve in its transition. At each stage of the evolution, the model suggests that knowledge growth correlates with increasing returns to the firm.

Adapting this model to the specifics of human capital, a similar map can be drawn to mark out the issues around optimizing the gains from human capital in a

¹⁴ Alan Burton-Jones. *Knowledge Capitalism: Business, Work, and Learning in the New Economy*. Oxford University Press. 1999.

knowledge intensive environment. It proposes to map the formation of an infrastructure for sustainable development of human capital against the returns from human capital. This provides a framework for examining and integrating the broad range of issues surrounding human capital management, taking an approach that involves reshaping the entire firm, instead of focusing only on the narrow issues normally considered under the traditional realm of human resource management.

While the model attempts to demarcate six different stages that signal a progressive strengthening of the infrastructure for human capital management, it is more likely that these stages (or at least some parts of them) are occurring simultaneously in practice. Each of the six stages is now described below, followed by a summary figure.

3.2 STAGE ONE : ASSESS AND DIFFERENTIATE

The first thing is to strip the sentiment from the subject of human capital. While human capital represents valuable assets, the truth of the matter is that in the context of a particular firm, not all human capital has the same value. Unless the management of a firm is prepared to be scrupulously honest about the value of each employee, including themselves, the efficiency of the resulting system will remain sub-optimal. The foundation for stage 1 begins with corporate awareness of the need to better manage human capital. The subsequent phases of

auditing, assessing and identifying begin the process by squeezing out inefficiencies.

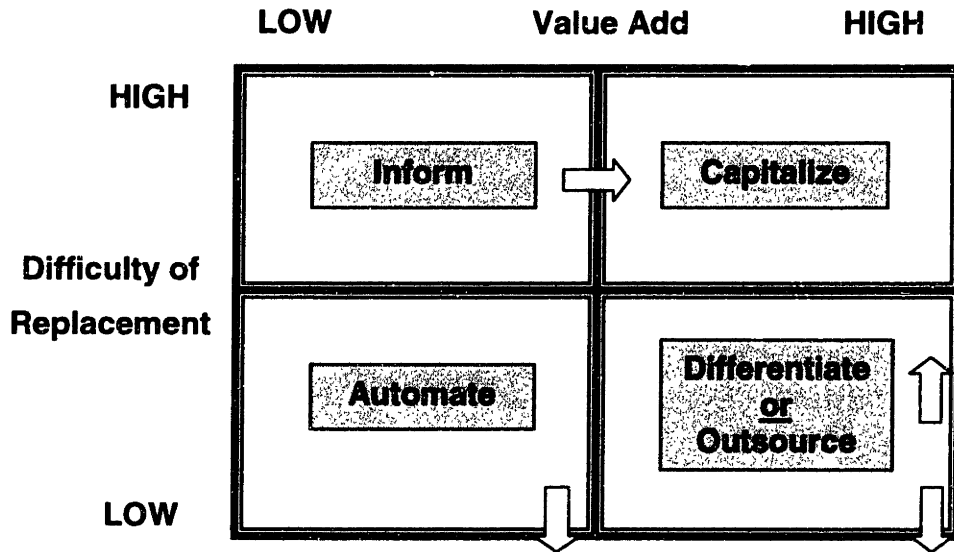


Figure 1 : Human Capital Audit Matrix

The 2 X 2 matrix above represents a simple but effective way of evaluating the existing human capital of a firm.¹⁵ The lower left quadrant includes low or unskilled employees who perform repetitive jobs that require little skills. In this case, the decision to automate is an easy one. In the lower right are employees who perform functions that are important but do not add to the competitive edge of the firm. An example is the billing department of an advertising agency. The department is an essential part of the company. Yet advertising contracts are not won on the basis of how efficient or well run the billing department is but on the creativity of the account team. Here, there are two choices, outsource or

¹⁵ Adapted from Thomas Stewart. *Intellectual Capital : The New Wealth of Organizations*. Chapter 6.

differentiate. By outsourcing, a company is liberated from the need to invest in expertise that isn't proprietary. The alternative is to find ways to turn generic knowledge into something that the firm can exploit in unique ways. The current trend of companies selling "solutions" rather than products exemplifies this effort of trying to differentiate high value, albeit commodity knowledge.

Those in the upper left quadrant present the trickiest management challenge. They are valuable from the perspective of the organization but less so in the eyes of the customers. The challenge here is to transform their work by adding more information value so that it starts to benefit the customers. An example is the quality assurance department. A repositioning of its role can begin by redefining the quality assurance objective as one of proactive prevention of mistakes, versus one of spotting and correcting mistakes. Value for the customer is created through lower cost of production and increased customer satisfaction.

Finally, the upper right quadrant represents the firm's most valuable human assets – the "stars." These are the individuals who have the talent, experience and drive to continuously create value for the firm's customers and as a result sharpen the competitive edge of the firm. They are exceptionally valuable to the firm but at the same time, their capacity for value creation makes them prized assets in the market. Unless there is a conscious and deliberate attempt to recognize these assets and increase the mutual benefits that the firm and these

individuals derive from their relationship, the firm will find it difficult to sustain its competitive edge.

In practice, this type of assessment needs to be undertaken in the context of a firm's long term strategy and as dictated by the rapidly changing competitive corporate environment. It demands that firms scrutinize the value add of their human assets just as closely as they scrutinize the potential returns from their financial or capital assets. Hence, this stage culminates with a clear picture of how the human assets of a firm are ranked in terms of their ability to generate value and leads to decisions about how the firm can streamline and optimize its human assets through outsourcing, automation and differentiation.

3.3 STAGE TWO : RE-ORGANIZE WORK

To capitalize on human capital, an appropriate structure and environment need to exist. Stage 2 begins by re-examining the basis on which work is organized. The hierarchical and functional structure that exists in many firms today reflects a flow of materials as it passes through the various parts of the firm and moves toward the output desired by the customer. While a functional structure is useful for building up specialized knowledge, it fails to provide a means for that knowledge to be shared.

What drives the need for new organization architecture is the knowledge firm's redefined role of coordinating, protecting, integrating and leveraging knowledge.

In the management of human capital, the firm has to provide the platforms for knowledge sharing and creation – through the use of teams, communities of practice, and other social forms of learning. Individual talent can walk out the door and therefore needs to be managed like the high risk proposition it is. Interdisciplinary teams capture, formalize and capitalize talent, because it becomes shared and less dependent on any individual. Even if group members leave, the knowledge stays behind. If the firm provides the locus of learning, it will be the chief beneficiary of learning, even when “leaks” to other companies cannot be prevented.

One interesting perspective on the basis for organizing work was proposed by Dana Mead, retired Chairman of Texaco. He posed the challenge of redrawing the organization chart to reflect how the various parts of an organization are networked in terms of information flow and relationships.¹⁶ This implies that the organization architecture needs to account for both the sources and flows of information. Three structures, integrated networks, virtual organizations and economic webs, are examined next, each associated with increasing degrees of networking, coupled with a movement from internal to external networking.

Bartlett and Ghoshal¹⁷ put forward the idea of an **integrated networked organization** — which they term “transnational” — operating in the context of

¹⁶ Dana Mead in “*Seminars in Leadership* : a series of talks organized by the Sloan Fellows Program, Massachusetts Institute of Technology. 18 October 2000.

¹⁷ Bartlett C and Ghoshal S. *Managing Across Borders : The Transnational Solution*. Harvard Business School Press. 2nd edition. 1998.

globalization. In this corporate form, the key thrust is to broaden the base of the firm's competitive capability, so that it can simultaneously be globally competitive, multi-nationally flexible, and able to capture the benefits of worldwide learning. By connecting people through a network, the depth of knowledge that a multi-tiered hierarchy offers can be replaced with the breadth of knowledge of the sum of the employees' collective experiences. The physical location of knowledge within the firm becomes less relevant. In practical terms, integration often starts with corporate-wide information systems (such as e-mail, databases and corporate yellow pages) that are technology-centric. However, the more critical objective of integration is to provide the setting for establishing a more collaborative culture

The concept of a **virtual organization** refers to an organization structure that is "non static or pre-defined but is a problem-related and dynamic link between real resources; a latent form of cooperation; a temporary, vertically integrated and non-hierarchical network of core competences."¹⁸ The virtual organization focuses on assessing a firm's core competence areas and leveraging external alliances for the non-core activities. An external network of suppliers, customers and partners form an entire infrastructure that supports the firm in its ability to deliver value to its customers. In the mobile phone industry, the trend towards outsourcing of phone production is a clear example of the move towards the virtual organization. In January 2001, Ericsson announced its strategic

¹⁸ Gabriele Sandhoff. *Virtual Organizations as Power-asymmetrical Networks*. Electronic Journal of Organizational Virtualness. Vol 1. No 1 (Special Issue). September 1999.

partnership with Flextronics which will take over the ownership, management and operation of the entire global production network of Ericsson. Likewise, Nokia recently announced the sale of its UK and Finish plants to SCI Systems in an effort to gain flexibility in meeting increased customer demands. The virtual organization relies on comparative advantage as the basis for resource allocation and reinforces the need for a firm to critically evaluate where it should best deploy its human capital.

Lastly, John Hagel III has proposed the idea of **economic webs**¹⁹ to refer to “clusters of companies that collaborate around a particular technology ... and that use a common architecture to deliver independent elements of an overall value proposition that grows stronger as more companies join the set.” By participating in an economic web, a firm further extends the network channels through which it can share or gain knowledge. The cross fertilization of ideas that takes place greatly increases the potential for new knowledge to be created. In the electronic commerce space, this is already taking place through B2B marketplaces such as Covisint, which aims to “transform the linear supply chain of the automotive industry into a far more productive and efficient networked model.”²⁰

Each of the three architectures — integrated network, virtual organization, and economic web — provides a framework for knowledge to be shared and

¹⁹ John Hagel III. *Spider versus Spider*. McKinsey Quarterly. Volume 1, 1996.

²⁰ Company website : <http://www.covisint.com/>

leveraged, both internally and externally. These architectures recognize that acquired knowledge does not need to be newly created or reinvented. The key lies in locating, mapping, integrating and exploiting it. The design of the organization facilitates the process and helps set the context for a collaborative culture.

3.4 STAGE THREE : UNDERSTANDING NEW ROLES

Knowledge creation within firms is predicated on autonomy, interaction and structure, with each being carried out at a different level – individual, group and firm. In a knowledge firm, the individual is granted greater autonomy and wider discretion in both thought and action. In turn, the responsibility to develop tacit knowledge falls squarely on the individual. However, the value of tacit knowledge to the firm begins to increase tremendously if it can be made explicit. For instance, if on-the-job knowledge that an individual acquires can be translated and embodied into systems, it can significantly lower the transition cost when that individual moves on and another takes his place. This requires interaction with others at the group level, and hence the importance of networked organization structures as described above. Stage 3 relates to understanding the new roles of individuals and managers.

With individuals taking over much of the “managerial” responsibility for creating knowledge, it is the individual who assumes responsibility for exploiting autonomy, generating interaction and imposing structure. Within the firm, these

responsibilities need to be articulated so that expectations can be set and a shift in mindset can begin to occur.

What about managers? Managers take on the role of managing resource supply, development and allocation, with talent being the resource in this case. The networked environment inspires an informal style and subverts managerial authority. As a result, managers are viable only to the extent that they, too, can contribute something unique. Firms contribute the structure and venue for knowledge creation. Managers can then add value by:

- **Defining** : Proposing a vision and mission for the firm that induce creativity, and bridge the real and the ideal. Deciding on the right businesses to be in and the necessary competencies and value system needed to achieve sustainable competitive advantage.
- **Nurturing** : Developing the human, structural and customer capital of the firm
- **Allocating** : Choosing the opportunities where resources should be allocated so that maximum returns can be gained.

The monitoring, control and gate-keeping roles of a manager are no longer priorities. While it may appear that the scope of a manager's duties has been reduced, the significance of the remaining portion grows in relative importance. Coincidentally, the acronym DNA captures well the very human-centric role of a manager in a knowledge environment.

3.5 STAGE FOUR : PERFORMANCE MEASUREMENT AND INCENTIVES

Incentives provide the motivation and reward for individuals to participate in a firm. Traditionally, firms have offered a wide range of incentives (both financial and non-financial) that are aimed at maximizing the utility of the individual. These incentives range from attractive working conditions to performance bonuses, promises of promotion, profit sharing and stock options, and psychological benefits associated with recognition and praise.

While firms generally claim to have performance-based pay systems, studies have shown that in practice, there remains a lack of differentiation between the performance of individual workers. According to a survey of 7,629 managers in manufacturing firms,²¹ it was found that over 95 percent of managers were ranked as good or outstanding. Only 3 percent was deemed acceptable and the rest not acceptable. The average premium for being good was only 3.9 percent higher than being acceptable and the difference for being outstanding rather than good was merely 2.5 percent. The issue lies in the difficulty of detailing specific performance goals in advance and designing a set of assessment metrics to measure output rather than input.

²¹ Medoff JL and Abraham KG. *Experience, Performance and Earnings*. Quarterly Journal of Economics. December 1995.

Designing performance metrics for measuring intangibles is no easy task but the appropriate metrics have a powerful ability to change mindsets and encourage the right behavior. The GE factory in Puerto Rico that produces surge protectors is an interesting case study.²² Compensation plans are built on a combination of skills, knowledge and business performance. Each person is rotated every six months, moving through the four main areas of the factory. Each rotation is associated with a raise and after the full circuit is completed, the individual can select an area of specialization, undergo additional training and eventually double his pay. Other measures of performance include the percentage of promises kept, level of knowledge acquisition and overall performance of the business. Overall, the intent is to turn blue-collar workers into knowledge workers, and the use of an innovative set of metrics is key to the subsequent transformation.

Another powerful incentive that firms have traditionally relied on has been promotion. The psychological benefits of promotion allow firms to offset the increase in financial rewards that would otherwise be needed as an individual is given expanded responsibilities. However, as firms become more streamlined, promotion as an incentive tool starts to lose its effectiveness. Promoting from within the firm also undermines the ability of a firm to tap external skills and knowledge.

²² *The Search for the Organization of Tomorrow*. Fortune. May 18, 1992

The issue of incentives comes about primarily because the ownership and control of a firm are beginning to converge. Both the firm and the individual can stake a claim on the knowledge output of a firm, reflecting a change in the corporate ownership structure. This leads to the central question of what the most appropriate form(s) of recognition for this increased ownership should be. Various schemes have evolved that reflect varying levels of participation, Employee Stock Option Plans (ESOP), Management Buyouts (MBO) and Codetermination (where workers and investors are elected to the Board of Directors). Further evolution of such schemes should head in the direction of “gain-sharing” where targets specific to individuals or groups of individuals are spelt out as the basis for sharing in the rewards of the firm.

In the end, the effectiveness of any scheme needs to be measured in terms of both financial rewards and a real increase in participation in corporate decision-making. Firms that can achieve both objectives will be well positioned to retain their key knowledge workers. Stage 4 requires that a firm review its measurement and reward systems to evaluate whether they meet the objectives of truly differentiated performance-driven rewards that strengthen an individual’s relationship with the firm.

3.6 STAGE FIVE : ENHANCE AND GROW

The shift to a knowledge-based economy demands that traditional relationships between education, learning and work be fundamentally re-appraised. There will

be no let up in the accelerated shift in demand from unskilled workers to skilled knowledge workers. Both firms and individuals will need to focus on and invest in preserving and growing their knowledge capital. The idea of lifelong learning is no longer a concept but becomes an economic and competitive necessity. Within the context of a firm, organizational learning takes place through on-the-job learning, structured training and increasingly in less structured, social settings such as “communities of practice,” a term coined by the Institute for Research on Learning in Palo Alto.²³

One of the central issues of organizational learning has to do with culture. The successful building of a learning organization demands unwavering commitment by the firm’s leadership to developing and nurturing the new culture of learning through changing assumptions and habits. At General Motors,²⁴ management commitment was reinforced by a number of measures that helped build its learning culture. First, all employees were required to undergo 92 hours of annual training. Next, training was structured to include sessions on company values to build a shared understanding of the business. Third, all employees shared responsibility for compliance with training requirements by accepting a small but symbolically powerful cut in bonus when the requirement was not met.

²³ <http://www.irl.org/>

²⁴ Don Cohen. *Managing Knowledge in the New Economy*. A report on the Conference on Organizational Learning, Chicago, April 15 – 16, 1998.

The next issue has to do with the infrastructure for learning. The current, largely publicly-funded educational system will come under tremendous strain in coping with future training needs. While firms recognize this and the larger ones with economies of scale have turned to building their own infrastructure (like corporate Universities), the greater challenge lies in gaining cost-efficient, broad-based access to learning resources. Education services as a business has tremendous potential as technological progress enables new ways of providing distributed, personalized learning. While the industry is growing rapidly, it remains in its infancy. In the interim, each firm has to take responsibility to ensure that its network for learning is as far-reaching as possible. By extending beyond its traditional boundaries, the firm ensures that it leverages all possible sources of knowledge for renewal and regeneration. An example is Siemens University,²⁵ which hands over the responsibility for solving real business problems to external analysts and Siemens engineers from around the world working in “student” teams. These teams share their analyses with business units and debate the benefits and costs of their plans.

Finally, from the perspective of measuring returns on investment, the firm needs to link the amount invested in training to the value derived – a truly challenging proposition. One way of addressing this is to enhance training roadmaps by adding competency components that are defined by customer needs. This

²⁵ Jackson S and Schuler R. *Mastering Management : Turning knowledge into business advantage*. Financial Times, 15 January 2001.

brings closer alignment between the firm's and the individual's gains from the investment in training.

Apart from structured learning, the firm also needs to rationalize its role in the learning that occurs in a social context. Brook Manville, former Director of Knowledge Management at McKinsey,²⁶ defines communities of practice as “a group of people who are informally bound to one another by exposure to a common class of problem.” These informal groups emerge on their own accord, drawn together by social and professional forces. While their agendas and deliverables are self-imposed, these groups are key learning structures within an organization, even when their presence sometimes undermines the formal structures. Managers can support communities of practice by recognizing their importance, giving them resources and encouraging their growth.

Hence, stage 5 is about the continued investments in human capital that are needed to ensure renewal of innovation capacity.

3.7 STAGE SIX : INTEGRATE AND BUILD TRUST

The sixth and final stage in managing human capital has to do with establishing trust. An integrated approach to managing the knowledge assets of a firm needs to not only separately address the issues of human, structural and customer capital, but more importantly, address the interaction of these three elements.

²⁶ Stewart T. *The Invisible Key to Success*. Fortune Magazine, August 1996

Trust is a response to the level of complexity and interdependence that the interaction of these elements entails.

In this context, trust is not about a warm, fuzzy emotion. Rather, it is the basis on which a firm defines and builds its relationships, with and among its employees, and with its business partners. Trust is the confidence that is placed in another's character, ability, strength and reliability. Jarvenpaa et al²⁷ presents both a rational and social perspective on what trust is. The rational perspective centers on the view of "calculus of self-interest", where trust is based on calculations that weigh the cost and benefit of certain courses of action between members. The social perspective centers on the view of "moral duty" which is based on shared common values.

Peter Keen²⁸ points to the trading partner agreements in electronic commerce as evidence that business to business relationships are moving in the direction of a trust-based operating environment. These agreements are designed with the idea that things will work out. They are explicit on responsibilities and accountability but they are designed to create an effective relationship space for the future. This is contrasted with the more common liability-centered contracts currently in use. These contracts attempt to cover every possibility of

²⁷ Javenpaa SL, Knoll K and Leidner D. *Is anybody out there ? Antecedents of Trust in Global Virtual Teams*. Journal of Management Information Systems. Spring 1998, Volume 14, No 4.

²⁸ Peter Keen. *Transforming Intellectual Property into Intellectual Capital : Competing in the Trust Economy*. Capital for Our Time : The Economic, Legal and Management Challenges of Intellectual Capital. Imperato N (Ed). Hoover Institution Press. 1999.

wrongdoing in legal fine print, on the premise that something will go wrong and that one of the parties is then at fault.

For a firm, trust incorporated into its value system and brand can be turned into a competitive advantage. Trust is domain-specific and can lower the “transaction” costs (i.e., the expense and effort needed to arrive at promised benefits) of all parties involved. More importantly, once it is in place, trust preserves the possibilities of future relationships. Consistency of intent and action, and hard work are needed to build and sustain trust in a constantly changing environment. This final stage of building a trust-based environment will have a broad and lasting impact on ensuring that knowledge management efforts, and thus the firm’s competitive advantage, are sustained in the long run.

3.8 SUMMARY

In summary, the six stages in managing human capital are captured in the Human Capital Management model on the following page. By adapting the Knowledge Growth Model™, the issues surrounding human capital management are surfaced and captured. These are then set in the framework of a roadmap that correlates the stages of building an infrastructure for sustained development with increasing returns from human capital. The management of human capital has to be a long term, strategic objective of any knowledge intensive firm and this model provides a systematic and holistic approach toward addressing this challenge.

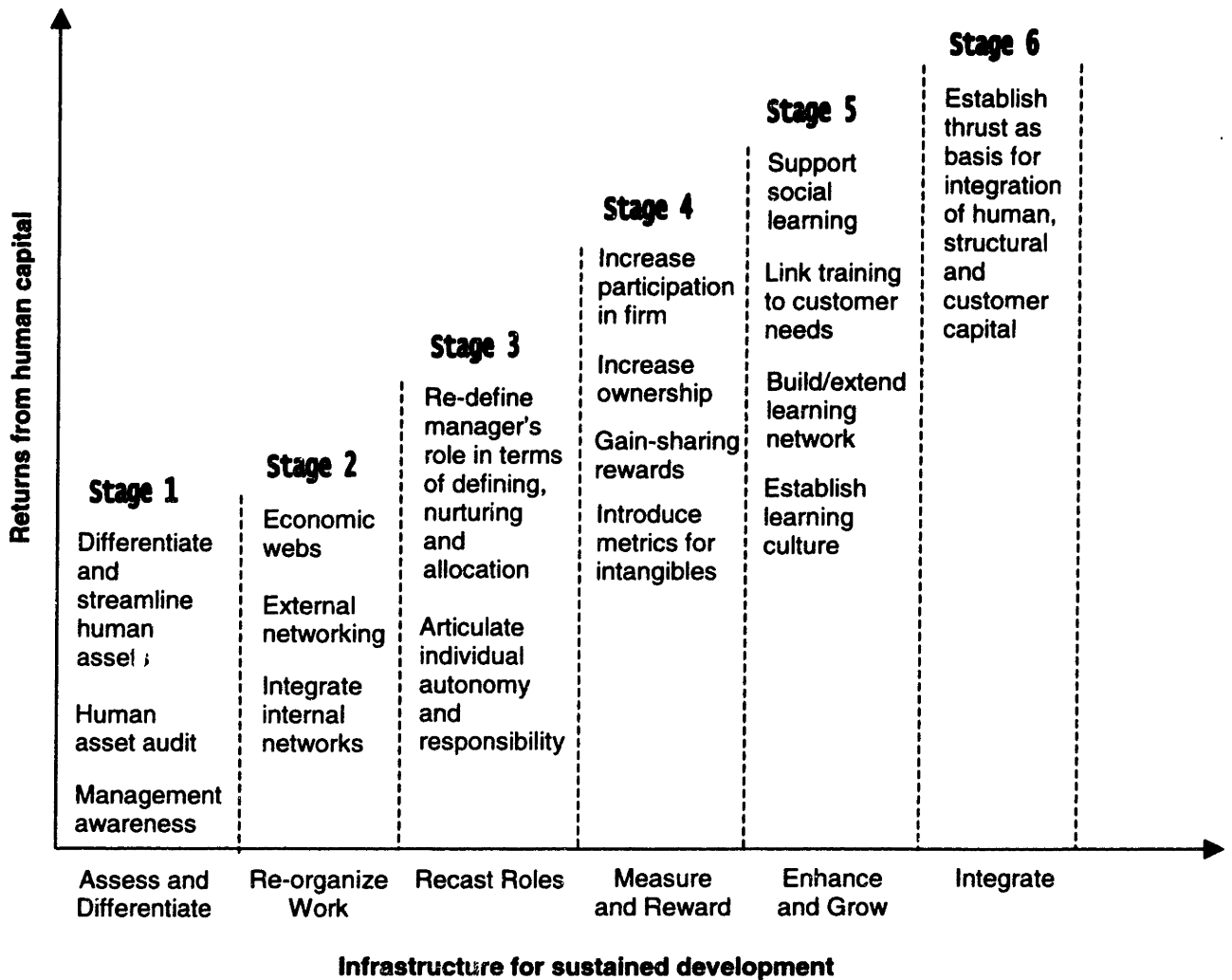


Figure 2 : Human Capital Management Model

CHAPTER 4

IMPLICATIONS OF THE KNOWLEDGE ECONOMY FOR THE INDIVIDUAL

4.1 THE NEW CAREER ENVIRONMENT

The knowledge economy has brought about what appears like endless re-organization of firms as they grapple with delivering sustained and improving performance in an environment defined by speed, connectivity, intangibles and complexity. The rate of job churn is high and is likely to remain that way. Even as firms lay off thousands of workers, they simultaneously hire as many. The difference between the laid-off and hired workers lie in what they bring to the table in terms of skills and knowledge. Job security is no longer assumed, by either the individual or the firm. This makes the entire notion of a career “path” within a firm redundant. Even if career paths can be defined, the ladders within a firm are few and short; while the chutes are many.

Against the backdrop of this new environment, the concept of a “boundaryless career” has emerged.²⁹ At the heart of this concept is the premise that a career bounded by well-defined roles, positions and jobs within the confines of a firm no longer supports employment in the knowledge economy. Other concepts of

²⁹ Michael B Arthur and Denise M Rousseau. *The Boundaryless Career : A New Employment Principle for a New Organizational Era*. Oxford University Press 1996

career point to a similar evolution. Mirvis and Hall³⁰ frame a person's career as consisting of "a whole set of activities that may not and probably will not come neatly packaged and defined as a "job" in one organization but that can constitute full employment, provide adequate compensation, and afford deep satisfaction to the individual." The same authors coin the term "protean career" to describe the career as "a process which the person, not the organization, is managing. It consists of all the person's varied experiences in education, training, work in several organizations, changes in occupational field, etc."³¹ Regardless of what term is used to describe the new career model, the assessment is common. A new way of looking at career growth and management is required.

In the previous chapter, the discussion was centered on how firms can examine and transform the way that they manage human capital, their key asset for the future creation of value. In this chapter, the focus is on the individual. The same forces that are reshaping the way that firms manage their human capital will impact the way an individual views his/her own career and its management. An understanding of these new perspectives will lead to a clearer definition and appreciation of the role of a knowledge worker in the new economy.

³⁰ Philip Mirvis and Douglas Hall. *New Organizational Forms and the New Career. The Career is Dead – Long Live the Career. A Relational Approach to Careers.* Douglas Hall (ed). Jossey-Bass Publishers. 1996.

³¹ Douglas Hall and Philip Mirvis. *The New Protean Career : Psychological Success and the Path with a Heart.*

4.2 PERSPECTIVES OF THE NEW CAREER MODEL

4.2.1 CAREERS AS REPOSITORIES OF KNOWLEDGE

Allan Bird³² defines a career as an “accumulation of information and knowledge embodied in skills, expertise and relationship networks that are acquired through an evolving sequence of work experiences over time.” With this definition, a successful career from both the individual’s and firm’s perspective is measured by the richness of the work content and its impact on the organization.

Firms offer a broad variety of work experiences. However, access to these experiences is often limited to a small, select group of individuals who are assessed to be “high potential” individuals. In the transition to a knowledge-intensive environment, the firm will have to find innovative ways of opening up access to different work experiences to a much larger group of individuals, a necessary step if the firm wants to more fully leverage its human capital. Faster job rotations, concurrent assignments and job assignments with corporate partners (such as suppliers and customers) are all ways to enrich the firm’s offering of work experiences.

For the individual, self-evaluation is the first step. The human capital audit matrix described in chapter 3 is as useful for the individual as it is for the firm. An understanding of one’s contribution to and role within the firm forms the basis for

³² Allan Bird. *Careers as Repositories of Knowledge : Considerations for Boundaryless Careers. The Boundaryless Career : A New Employment Principle for a New Organizational Era.* Oxford University Press. 1996

evaluating whether one's work experience is expanding his skills, expertise and networks. If there is no accumulation of new knowledge, then an individual is living off his/her existing store of intellectual capital. Over time, he/she may be destroying rather than building wealth.

Self-evaluation thus provides the impetus for an individual to adopt a proactive approach to career management by actively pursuing and building a portfolio of experiences that enhances his/her intellectual capital. It demands that an individual first understands his/her role and contribution within the firm, and use this as a backdrop against which to evaluate the opportunities for career enrichment. This is consistent with the realization that in the new organization, power flows primarily from expertise and not position or seniority.

4.2.2 LEARNING AS A LIVING

Continuous learning is the primary means through which human capital can be renewed, upgraded and expanded. In the environment of frequent job movements and continuous corporate restructuring, an individual's career progression will be contingent on his/her ability to adapt to each new situation as it arises. Individuals who are ill-prepared or unable to adapt to these changes will likely find themselves downwardly mobile at an earlier than expected age or simply ushered out.

The ability to adapt is contingent on the breadth and depth of an individual's portfolio of skills and experiences. In a broad sense, continuous learning for an individual is akin to the building and management of this portfolio. Similar to an investment portfolio, it requires active monitoring and evaluation, an astute understanding of the changes in the macroeconomic environment, a sound strategy and effective execution in order to maximize the returns from the portfolio. The strength of this portfolio will be an indication of how secure an individual's links to future opportunities are. Thus, continuous learning has to go beyond the training and development programs that take place in a structured and formal setting. It needs to embrace the real time learning that occurs on-the-job, within teams and between individuals.

Lifelong learning also demands a new perspective on the purpose of learning and the learning objectives. Learning requires "more than 'knowing that'; it identifies the links between causes and effects that underpin 'knowing how'; and it is able to confront the difficulties and conflicts entailed in 'knowing why'."³³ This implies that learning has to take place at much greater depth, going well beyond the information level, before intellectual capital can truly be enhanced. Since learning does not occur in a vacuum but is increasingly integrated into the environment around us, it becomes useful to view learning causes and objectives within the context of what is happening globally, within the firm and at the personal and social levels. Annex B gives one perspective of how to consider

³³ Bill Law. *Learning for work : Global Causes, National Standards, Human Relevance. The Future of Career.* Audrey Collin and Richard Young (editors). Cambridge University Press. 2000

learning objectives within the context of worldwide causes, changing patterns of employment, and personal and social effects.

All these make the learning agenda more subtle and layered, demanding that individuals probe deeper into the rhetoric of learning, towards meeting the objective of aligning learning with career growth.

4.2.3 VIEWING RISKS AS OPPORTUNITIES

Careers will begin to unfold in a series of peaks and valleys that are defined by periods of learning, mastery and rewards. For each individual, the more traditional concepts of career as a linear progression of upward moves or a fairly predictable series of discrete stages will be replaced by more flexible, less predictable career paths that are unique to each individual, much like a career fingerprint. Intrinsic rewards become as important as extrinsic rewards in the wealth creation process. This makes it essential for individuals to adjust expectations about career progress and to savor the intrinsic rewards and psychological success that come from challenging new assignments.

The perception of each new challenge needs to change from one of a chance of loss to an opportunity for gain. This requires a paradigm shift in mindset. Just as firm restructuring is a necessary response to changes in the competitive marketplace for the sake of corporate survival, an individual needs to be driven by the same instincts for survival. Career development thus evolves into a series

of risk management choices, where the rate of return determines the range of future options.

4.2.4 TAKING CHARGE : A CALL FOR INDIVIDUAL RESPONSIBILITY

In the knowledge-intensive environment, individuals become the main agents in career direction and progression. This is driven by the fact that the ownership of human capital is increasingly a joint account between the firm and the individual. The new career model creates tension in the juxtaposition of individuals' interests with those of the firm. On whose behalf is the knowledge creation process being managed – firms or individuals ? DeFillippi and Arthur³⁴ propose that the answer is provided by the discipline of the market, in which individual and firm are aligned through mutual self-interest. Careers and firms remain connected only insofar as they move in the same direction.

Facilitating this process has been the creation of new channels on the internet that materialize the value of human capital. Websites such as <http://www.talentmarket.monster.com/>³⁵ and <http://www.bid4geeks.com/>³⁶ allow individuals to connect directly with firms, and make the individual solely responsible for being a proactive participant in the human capital marketplace. These new channels aim to provide a far more efficient way of matching

³⁴ Robert J DeFillippi and Michael B Arthur. *Boundaryless Contexts and Careers : A Competency-Based Perspective*.

³⁵ Talentmarket.monster.com claims to be the first human capital auction website and is part of [monster.com](http://www.monster.com), the job search website. Within 2 months of its creation in July 1999, there were 100,000 registered "contractors" of human capital that resulted in 26,500 auctions in 4 months.

³⁶ Bid4geeks.com is an IT talent auction site created by John Kinsella, one of the sixteen original employees of E-Bay.

available human capital to market requirements, eliminating wastage in terms of under-utilized human capital. Seen from the individual's perspective, there is new freedom to self-design work, including discretion over how work is organized, prioritized and delivered. In the same way, the individual now takes control over the critical tasks of managing his continuous learning process and for building the complex network of relationships among individuals, teams and firms that help to define his career fingerprint. These new responsibilities call for new skills in creation, judgement, imagination and execution that an individual has to learn and master.

Each of these developments reaffirms the fact that the individual has to now take charge and play a central role in career development. It calls for the individual to adopt a mental model that is almost akin to self-employment.

4.3 A FINAL WORD

In the new career model, intellectual capital is the source of wealth for individuals. The boundaries between personal interest, family interest, firm interest and social interest have grown more fuzzy. Each of these interests will interact and contribute to the development of an individual's career path and the subsequent wealth creation capacity and process. The new perspectives recolor the lens through which an individual considers his/her work life, the choices that are made along the way and their determinants, and finally the accountability for its outcome. This does not imply that career management is reduced to a

strictly personal affair. Firms continue to play an essential role in creating the context in which meaningful careers can evolve. However, given the absence of structures, hierarchy and roadmaps to act as external guides, “it is *organizing* and not organization that is the catchword of the new career model”³⁷.

³⁷ Suellen M Littleton, Michael B Arthur, and Denise M Rousseau. *The Future of Boundaryless Careers*. The Future of Career. Audrey Coiin and Richard A Young (editors). Cambridge University Press. 2000.

ANNEX A

KNOWLEDGE GROWTH MODEL™ OF THE FIRM

The Knowledge Growth Model™³⁸ proposes a way of mapping the progress of a company as it transitions into a knowledge-intensive firm. While largely qualitative, it provides some standard measurement criteria that can serve as a basis for benchmarking within the firm and among firms.

Within the firm, this model may find practical uses in areas such as:

- Determining potential training and human resource requirements
- Helping management plan future knowledge investments
- Identifying corporate strengths and weaknesses

Stage 1 : Knowledge Recognition

The first step is the creation of corporate awareness of the importance of knowledge as a factor of production. Firms will need to conduct knowledge audits to analyze the value of their knowledge assets.

Stage 2 : Knowledge Organization

This stage is characterized by reduction in middle management layers, accompanied by progressive externalization of non-core functions and internalization of core functions. During this stage, internal systems and

³⁸ Burton-Jones Alan. *Knowledge Capitalism : Business, Work and Learning in the New Economy*. Oxford University Press. 1999.

processes will need to be re-engineered to take advantage of the firm's updated conception of its knowledge base and to reflect resultant changes to its strategic focus.

Stage 3 : *Knowledge Networking*

This stage will be characterized by diffusion of decision making and increased use of cross-functional teams. Other features of this stage of growth will include increasing homogeneity in worker skills and functions performed, and greater focus on creativity and innovation.

Stage 4 : *Knowledge Rewards*

The firm now needs to realign its incentive and reward systems with its revamped internal structure and knowledge focus.

Stage 5 : *Knowledge Enhancement*

This stage is marked by increased investment in R&D and in training, and by a refinement in the linkages in the firm between its products and its knowledge base. During this stage, the firm will also improve its external links to providers of training and product development.

Stage 6 : Knowledge Enterprise

Knowledge management and business management have fused, resulting in a knowledge-centered enterprise. Growth and competitive strategies will be knowledge based.

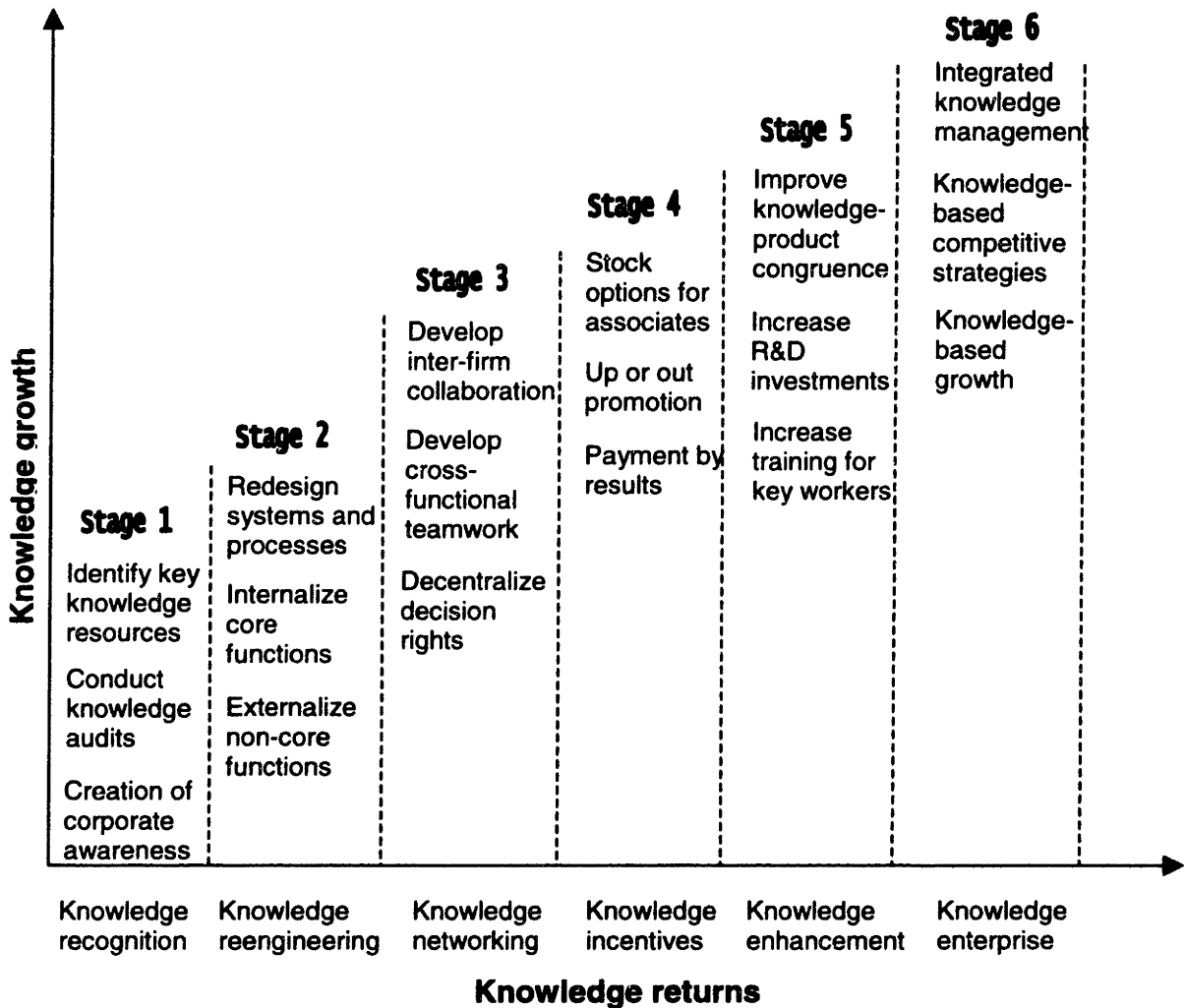


Figure 3 : The Knowledge Growth Model

The first three stages typically involve a process of reassessment and restructuring in order to lay the foundations for knowledge-led growth. From

stage 4 onwards, firms begin to accelerate up the growth curve, using their knowledge resources increasingly for innovation and competitive advantage.

ANNEX B

LEARNING FOR WORK

The following table is adapted from *Learning for Work : Global Causes, National Standards, Human Relevance* by Bill Law³⁹ to illustrate the links between causes, their implications on work and the ensuing learning objectives.

Table 2 : Understanding contemporary working life

Cause	Implications	Learning Objectives
New Technologies	Complexity of production, distribution and exchange confront all parts of society	<ul style="list-style-type: none"> • Skill in new technologies at work • Understanding change in work roles
Smaller government	Competitiveness releases business from regulation, affects social fabric and develops a 'flexible' workforce	<ul style="list-style-type: none"> • Ability to deal with a flexible labor market • Understanding a reduced welfare provision
Changing economic structures	Effects are cyclical, demographic and structural – varying among sectors	<ul style="list-style-type: none"> • Knowledge of causes and effects in variable work distribution • Understanding who is most at risk
Extending concepts of work	More of what is done in domestic, freelance, voluntary and other modes is thought of as 'proper work'	<ul style="list-style-type: none"> • Understanding why people work • Appreciating alternatives to employment and unemployment
Adapting work locations and requirements	Firms are smaller, 'flatter'. More work is done at home. Skill requirements are changing.	<ul style="list-style-type: none"> • Ability to deal with contemporary work locations and procedures • Ability to respond to changing requirements

³⁹ Bill Law. *Learning for work : Global Causes, National Standards, Human Relevance. The Future of Career.* Audrey Collin and Richard Young (editors). Cambridge University Press. 2000.

<p>Transitory work contracts</p>	<p>Collective, full-time contracts are less common; portfolio careers more common</p>	<ul style="list-style-type: none"> • Ability to find and approach work opportunities • Ability to negotiate with recruiters
<p>Discontinuous experience</p>	<p>Individual experience is increasingly fragmented, offering shorter periods of sustained contact</p>	<ul style="list-style-type: none"> • Ability to make continuing sense of fragmented experience • Ability to maintain identity – even in rejection
<p>Reconstructed community</p>	<p>Work connects people to neighborhood and community – a stake in society is lost to those without work</p>	<ul style="list-style-type: none"> • Appreciation of supportive social attachment • Ability to discriminate who and who not to attend to

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