

Capital Systems: Implications for a Global Knowledge Agenda

Published in *Journal of Knowledge Management*, Vol. 6, No. 4, October 2002

Francisco J. Carrillo

The author **Francisco Javier Carrillo** is Chairman of The World Capital Institute

Keywords

Knowledge-based Development (KBD), Capital Systems©, Knowledge-based Value Systems©, K-events

Abstract

This paper explores ways in which KM can enrich and be enriched by practices associated with social-level Knowledge-based Development (KBD), thus bridging both fields. It begins by establishing a continuity between personal, organizational and social level KM. Social-level KBD is referred to Economic Growth Theory in search of a *complete, consistent, systematic* and *inclusive* framework for global development. Enter *Capital Systems*, a KM framework aiming to satisfy those criteria at the organizational level. The Capital Systems approach, originally developed as a solution to some methodological concerns in Intellectual Capital valuation, is described as the operationalization of a generic value structure. Such a structure is applied to the analysis of the *production* or *value-enhancing* dynamics underlying major economic eras throughout human history until today's preeminence of k-based production factors. Structural constraints in current financing for development practices are identified. Untapped k-capital dimensions are then introduced to explore new k-based development strategies. Finally, examples of current KBD policies are examined in the light of this analysis and alternative strategies to systematically identify and develop individual, organizational and capital systems are suggested.

The KM-KBD link

A synergistic convergence

The explosive evolution of the KM Movement has been attributed to three economic drives which ignited amidst the expansion phase of an unprecedented global business cycle. The drives identified (Carrillo, 1999) were i), the need to align overwhelming information resources and technologies; ii) the accelerating obsolescence rate of labour competency; and iii) the increasing awareness of the role of "intangible " production factors.

The business-driven origins of KM have earned it citizenship in corporate environments. But as the KM Movement evolved from a "dispersion" to a "contraction" to an "institutionalization" phase (Carrillo, *op cit*), it found application opportunities in areas such as education, government, international agencies, NGO's and other major kinds of human organizations. As KM comes of age, it is evolving into a strategic management approach, applicable to purposeful human organizations in general.

The emergence of knowledge societies has multiplied the extent to which both productivity innovations and social transformations rely on knowledge capital. Major international agencies such as the World Bank (1998), the UNO (2001), the OCDE (2001) and regional development institutions like the European Commission (2001) and the Commonwealth (Mansell, this issue) have adopted KM frameworks.

Regardless of the level of application, the rationale for KM is basically the same: to leverage the value-generation capacity of individuals, groups, and organization as a whole. "Value" here is considered in a broad axiological sense, including all criteria to determine which options are preferred over which others. Therefore, value-generation refers to an recognizable progress in the pursuit of the specific goals and purposes of an individual system (personal, organizational, social).

Hence, KM processes and methods are generic to all kinds of organizations, while KM tools and techniques can be quite specific. For instance, a KM certification program offers dual commercial and government certification tracks, where the KM approach is basically the same, and the difference is one of emphasis (KMCI, 2001). Comparison between KM practices in commerce and government, public and private suggests differences of degree, rather than of substance (Lelic, 2002). A similar distinction can be drawn throughout commercial organizations themselves, where differences in KM procedural focus can be found by industry (oil, manufacturing, consulting, finance), size (global corporations, large and medium companies, SB's), and developmental phase (new ventures, mature business).

Consequently, a continuum of KM concepts and approaches across the social, the organizational and the individual domains is becoming increasingly evident. While the

status of organizational-level KM is obvious to most KM practitioners, this is not yet so evident at the personal and social levels. The comparative status of each of these domains is analyzed below. Indeed, the main contention of this paper is that the scope for KM theory and practice can be furthered to encompass all three levels and that in doing so, KM can collaborate in a multidisciplinary effort to unleash the development potential of individuals, organizations and societies. The main body of the paper is devoted to substantiating this claim, with particular emphasis on social-level KM (KBD). Table I shows the correspondence between these three domains, the level of KM practice and the associated label (frequently used acronym).

Table I Social/organizational/personal domains and corresponding KM functions and labels

<i>Domain</i>	<i>Function</i>	<i>Label</i>
Individual	Personal KM	PKM
Organisational	Organisational KM	KM
Social	Knowledge-based Development	KBD

© FJ Carrillo, 1999

The multidisciplinary nature of an integrated KM field is bound to contain multiple issues which deserve attention by subject-matter specialists. The intention of this paper is to point out enough common grounds between KM and KBD to encourage further multidisciplinary work in this direction. This would be of significance to both KM practitioners and specialists from disciplines currently and potentially associated with KBD.

Personal and social KM

Although individual-level KM received proportionally little attention in the early phases of the movement, it was somehow implicit. An underlying intuition is now getting wide recognition: personal development is the building block (or better still, the living cell) of all k-based¹ organizational and social development. This concept was well captured by Bennis (1997): *"In the best of all possible worlds, community and individual growth are complementary goals, not incompatible ones"*.

Personal development frameworks are rooted in the value base of cultures and religions. That circumstance draws our attention to the axiological and epistemological axes on which a particular personal development scheme is anchored. Furthermore, psychology

¹ Throughout this paper, the abbreviation "k-" is extensively used as a prefix. Every occurrence denotes that the term preceded by it applies to those instances where knowledge processes are predominant. Thus "k-capital" denotes forms of capital built on cognitive and emotional value, while a "k-event" is an act of knowledge.

and other social sciences have made significant contributions to identifying developmental patterns in human individuals and their relation to specific cultural settings.

Those philosophical and scientific perspectives might now be inserted into the domain of individual KM, some more obviously than others. There is a natural correspondence, to instantiate the most obvious, between the recent development of "Emotional Intelligence" (e. g., Goleman, 1995) and "Personal Intellectual Capital". Consider Stewart's closing remark to his 1997 review of IC: "Intellectual capital is the source of wealth for individuals as well as for organizations -and it is held in common between them" (1997, p.216).

Other contributions in the psychology and sociology of knowledge are finding their way into Personal KM -PKM, as it is becoming known. Pienaar (1999), for example, offers a scheme for developing the personal knowledge base. Skyrme (1999) has explored the individual bases of organizational growth, while West (2001) has articulated the concept of "The Individual as a Brand". More recently, Bhatt (2002) addressed the interdependencies between individual and organizational knowledge and the distinctive strategies required to develop each level. To judge from the growing attention it is receiving, PKM is here to stay.

With regard to the social level, the concept of leveraging collective development through knowledge also has a millennial tradition. Major ancient cultures and religions make references to the social worth of knowledge. Confucius (c. 551-479 B.C.) is well identified as a pioneer in k-based political economy.

Throughout the centuries, philosophers and statesmen have sustained the view that social investment in learning pays. But this political stand could not be supported by empirical evidence until a few decades ago. In the course of the second half of the 20th century, many economists, including Nobel laureates Robert Solow and Gary Becker, provided compelling evidence of the causal relation between social k-base and economic growth. Such a relationship is now widely recognized. By the year 2000, all major international development agencies and nations with the highest levels of overall development had espoused deliberate KBD policies.

Some of the most evident convergence points between KM and KBD have already been addressed by Economic Growth Theory (EGT), to which we will refer later. EGT made significant contributions well before the advent of KM. But other contributions, perhaps less apparent, may help to determine the social dimensions of knowledge. Take as an example the notion of knowledge as a social construction. Actually, the field of Social Epistemology is ... "an intellectual movement of broad cross-disciplinary provenance that attempts to reconstruct the problems of epistemology once knowledge is regarded as intrinsically social". (The Norton Dictionary of Modern Thought, 2001). Thus, the continuity between individual, organizational and social levels of KM seems rather

natural. It is therefore assumed that the analyses carried out throughout this paper apply to all KM domains regardless of the scope of the particular system under consideration.

In seeking the implications of such continuity we will be making reference to a specific KM approach which looks at an underlying stratus of all three KM levels: Knowledge-based Value Systems (Carrillo, 1998). The technical side of such conceptual approach is The Capital Systems Method. This method, to be summarized below, was developed in a business environment. It is therefore of intrinsic relevance to productive organizations. Thanks to its generic value base, its applicability to non-productive organizations is becoming increasingly evident. K-Based Capital Systems have been applied to R&D units (CKS, 1998; Torres 2002), universities (Barrientos, 2002) and government (Villarreal, 2002). Its further applicability to regional and global settings is explored next.

Beyond commercial globalization: from national to planetary wealth

One of the axes of modernity was the advent of the Nation State. Adam Smith identified The State as a prime reference to collective good and founded the competitive characterization of national economies on this assumption. In *The Theory of the Moral Sentiments* he writes,

The state or sovereignty in which we have been born and educated, and under the protection of which we continue to live, is, in ordinary cases, the greatest society upon whose happiness or misery, our good or bad conduct can have much influence (...) When we compare it with other societies of the same kind, we are proud of its superiority, and mortified in some degree, if it appears in any respect below them (...) The love of our own nation often disposes us to view, with the most malignant jealousy and envy, the prosperity and aggrandisement of any other neighbouring nation.
(Part VI, Section III, Chap. II)

Smith's analysis prompts another key issue of the KM-KBD convergence. As long as the coexistence between individuals, groups or nations is seen as predominantly zero-sum, interaction strategies are bound to be predominantly competitive. The former statement implies no value judgement on competitive behavior nor a human predisposition towards competition. In fact, from the perspective of contemporary psychology, competition need not be seen as a predisposition, but simply as an array of circumstances that allocates a value outcome to a particular behavior. So is cooperation. Both cooperation and competition result when the associated outcomes are inclusive or exclusive.

In Smith's naturalistic analysis, rivalry amongst nations is the product of distinctive competitive conditions. Were those condition to become a commonwealth of interests, an outcome of benefit to mankind, then ... " *In such improvements each nation ought, not only to endeavour itself to excel, but from the love of mankind, to promote, instead of*

obstructing the excellence of its neighbours. These are all proper objects of national emulation, not of national prejudice or envy" (ibidem).

Both at the level of the individual organization (KM) and at the social level (KBD), the above considerations are important. At the organizational level because we are witnessing a trend towards "co-opetitive" transaction patterns, where both competitive and cooperative schemes contribute to maximize the value outcomes of a given system. The contribution by Escribá-Esteve and Urra-Urbieta to this special issue explores from a KM perspective the phenomenon of increasing inter-firm cooperation.

From the KBD perspective, attention to supranational schemes may help circumvent some of the dead ends in which the north-south dialogue on development seems to be trapped. If international KBD transactions were to complement national interests with global ones, value dynamics would change. Posmodernity brought the transcendence of the nation state, the emergence of transnational corporations as major economic entities and globalization. Today, several *Fortune 100* companies have as much economic output as medium-size countries. Supranational economies left their mark in the 20th Century.

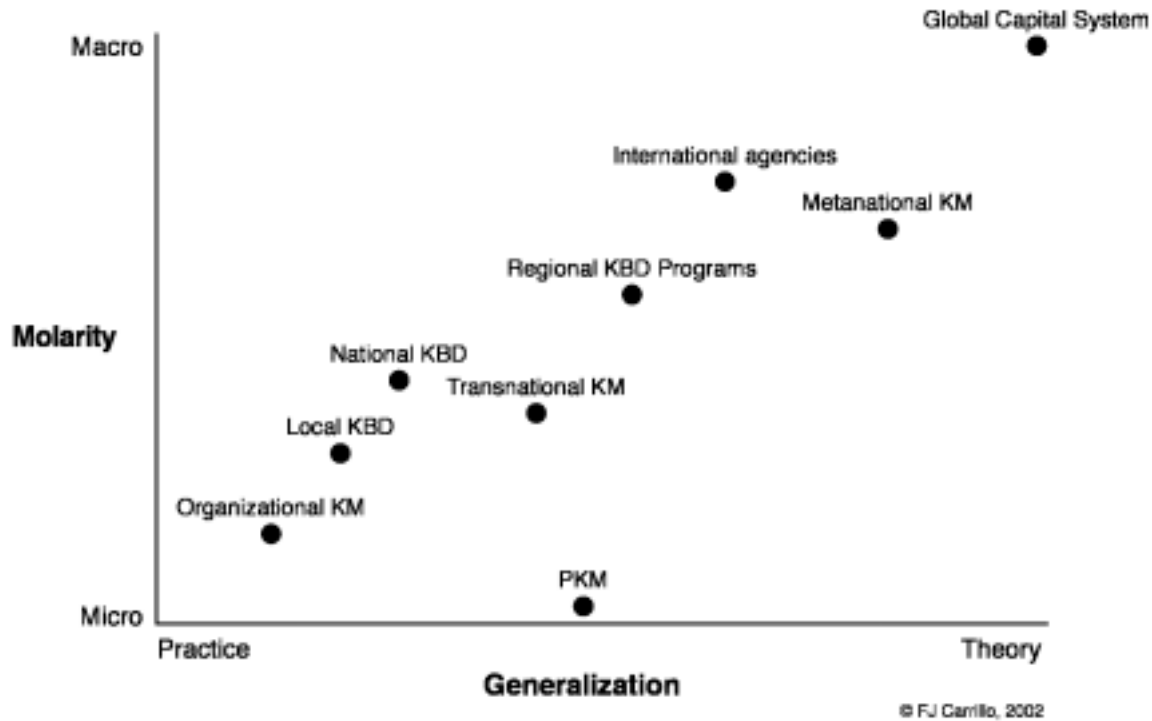
As we advance into the New Millenium, "*a reevaluation of the theory of the multinational firm*" takes shape through the emerging paradigm of the Metanational Company: ... "*a company that builds a new kind of competitive advantage by discovering, accessing, mobilizing, and leveraging knowledge from many locations around the world*" (Doz, Santos and Williamson, 2001). Subtitled "How companies win in the Knowledge Economy", Dox *et al's* book *From Global to Metanational* covers new ground in addressing the distributed and k-based nature of today's economy by addressing two key questions: How dispersed are the clusters of critical capabilities and markets that companies need to succeed? And: How can globally dispersed knowledge best be combined and leveraged?

From national, to transnational, to metanational. What next? The obvious answer is global or planetary value systems. Both terms are used here as synonyms, for they both refer to the world as a whole: "*relating to, or involving the entire earth*" and "*of or affecting the entire world*" (respective entries in *The American Heritage Dictionary of the English Language*). Although the use of "global" often denotes "surface area" as in "a global company with operations in 120 countries", it is important to stress the holistic and systemic use of global or planetary (Laszlo, E., 2001). Amidon (in press) has advanced a framework for global collaboration based on knowledge and innovation.

Thus, *global or planetary* development will mean more than worldwide capital flows and commercial transactions. It will mean the overall balance of our planet as a value system. Hence, we will be looking at the following characteristics of today's economic realities: *distributed, global, k-based, and co-opetitive*. Figure 1 shows how some KM and KBD practice fields compare with regard to their levels of *molarity* (from individual,

through organizational and regional, through global) and *generalization* (to what extent practice rests on concrete experience or conceptual abstraction).

Figure 1 Hypothetical molarity vs. generalization of KM / KBD practice arenas



Growth vs. Development

Sinergies between KM and EGT may contribute to a better understanding of KBD. Whereas EGT counts on a substantial scientific tradition, KM can bring new insights into how k-processes may leverage the capacity of a value system to achieve and sustain creative balance. The Capital Systems approach aims at representing all significant value dimensions for collective decision making.

Two characteristics of k-capital must be emphasized at this point:

- It is not only cumulative (stock) or transactional (circulant), but also *referential* and *relational*. An increase in its amount or flow does not necessarily lead to a better system balance. More is not necessarily better.
- Different forms of capital call for different overall-worth tactics. Whereas preserving, retaining, accumulating and mobilizing are effective stock and flow tactics, other forms of k-capital call for other tactics.

It was precisely the identification of new value dynamics in economic growth which led to the emergence of 'Endogenous' or 'New' Growth Theory (NGT) as an alternative to mainstream EGT. The 'endogenous' or 'from inside' character of NGT arises from the consistent realization of a faster growth in a productive system's output than what the external factors alone could achieve. The 'new' character derives from the departure from Solow's work in that... *" the rate of technological change, and a fortiori the rate of growth, is no longer taken as given from outside, but is envisaged to depend on the 'behaviour' of agents that is, on their preferences or tastes"* (Kurz and Salvadori, 2002).

These insights have awakened EGT from its relative slump in the 1970s and early 1980s to its current boom (Kurz and Salvadori, *ibid*). Some of the contributions, notably those of Paul Romer, are of special significance for KBD and KM in general. In his paper, "Increasing Returns and Long Run Growth," (1986), he proposed a model in which economic growth is driven by the accumulation of knowledge. Therein, he identified some key differences between knowledge and physical capital (see We, 1994 and HET, 2002, for a summary of his views).

Gemmel (1997) provides a non-technical review of the literature on NGT. He includes the following remark on Romer's contributions,

Numerous models incorporating R&D activities and the production of 'ideas' have been developed, but Romer (1986; 1990a, b; 1993) are among the most prominent. Romer (1990b) for example models an endogenous growth process in which growth results directly from physical capital investment which in turn is driven by investment in a research and development (R&D) sector generating ideas for 'new' designs/goods. These new goods, by being used as intermediates elsewhere in the economy, provide the driving force behind knowledge accumulation. Romer then hypothesises that the creation of these new designs/goods is a function of the stock, as well as the growth, of human capital in the form of 'basic' and 'applied' scientific knowledge acquired via higher education. Thus firms operating in countries with a larger pool (and faster growing pool) of qualified scientists can innovate more readily and therefore enjoy more rapid rates of technical progress and productivity growth. (Ibid, section 2.18)

However, NGT is far from consensual. There persists a good deal of unresolved questions and even a lack of some fundamental definitions. More recent analyses have raised issues which are of critical significance to any knowledge professional. In their well-known review, Aghion and Howitt (1998) diagnose: *"we do not have any generally accepted empirical measures of such key theoretical concepts as the stock of technological knowledge, human capital ... the rate of obsolescence of old knowledge, and so forth"* (p 435).

Steedman (2001) has pointed out the many problems that NGT faces in dealing with k-capital. He reviews several prior warnings on the assumptions made regarding the

nature of "the stock of knowledge", to conclude: "*It is certainly – and lamentably – common in the NGT literature to treat the ‘stock of knowledge’ as if it were a single magnitude with a cardinal measure, without any justification being given for this highly dubious assumption*" (p. 2).

Despite these concerns, NGT has already had a profound theoretical and political impact. Knowledge professionals can benefit both from learning about the new findings and novel interpretations of NGT, and from realizing potential contributions to KBD from KM practice insights. For an authoritative and updated review of the field, Solow (2000) is a must. The review by Aghion and Howitt (1998) is more extensive and technical. Jones (1998) provides an accesible introductory reading.

As much as there is to learn from EGT, there are several other fields which become essential for a venture such as Global Capital Development. Specifically, there is a convergence between the "sciences of development" and the "sciences of knowledge" (Carrillo, 2001) into the field of KBD. The area of convergence is largely uncharted territory.

It is important to keep in mind that both development and knowledge refer to the whole domain of human experience and potential. Hence, all relevant dimensions must be taken into account. That challenge underlies the business rationale of KM as well as the human and political significance of KBD.

The KBD challenge

A KBD Field Theory must clearly satisfy some requirements to comprehend a Global Capital System. First of all, it must be *complete*: encompass all basic domains of collective human experience contributing to a sustainable global balance. That is, it should be radically k-based.

Knowledge is not a thing, a mere record in a medium. In its widest meaning, it is the articulation of experience: that cultural-psychological event by which relevant pieces of the world get connected with relevant perceptions and actions. Knowledge consists of value-enhancing associations. Therefore, KBD and KM are, above all, a matter of relevance or value: representing and managing value systems.

Secondly, a KBD Field Theory must be *consistent*; that is, every k-factor must be expressed in terms of the operations to determine whether it occurs or not and in what proportion. For this purpose, quantitative and qualitative comparisons are legitimate, provided there is awareness of the scales in use. Some dimensions may prove to be too elusive, but we must humbly recognize what our current level of understanding of a value category is.

Thirdly, a KBD Field Theory must be *systematic*. This implies both a formal conceptual structure and a systems perspective. Given the complex multidimensional interrelations

of k-events, insights from Complex Adaptive Systems are valuable when dealing with KBD dimensions such as those depicted in fig. 1.

Although many requirements seem pertinent, a fourth one is indispensable: it must allow for diversity while achieving basic consensus; *i.e.*, it must be *inclusive*. Premature homogeneity and artificial standardization have limited use and can become counterproductive. In seeking global significance, a capital system must capture first those major dimensions which are common to all elements in the system. The UN Universal Declaration of Human Rights is a concrete example of a consistent, operational and inclusive subset of a global value system.

The pursuit of a global capital system also carries some risks. In an exploration of the globalization of the KM Movement, some "potential negative impacts" have been identified (Carrillo, 1999), including abuses, intrusions and misappropriations. A global capital system should assertively identify alternative and critical views (*e.g.*: Baudrillard, 1991; Bluden, 1998; Fuller, 2001; and Wilks, 2001).

Knowledge-based Development

KM domains: objects, agents and contexts

In his assessment of Endogenous Growth Theory, Fine (2001) considers amongst other critical issues " *the incorporation of factors that have traditionally been outside mainstream economics*". Steedman (2001) starts his own critical account by pointing out: "*In all too many contributions to New (Endogenous) Growth Theory – though not in all – central reference is made to ‘a stock of knowledge’, a ‘stock of ideas’, etc., this variable featuring centre-stage in the analysis. Yet it is immediately apparent that this is far from being a crystal clear concept*".

As mentioned before, KBD may benefit as much as KM from a conceptual and methodological collaboration. The theory and practice of KM might provide some insights to a multidisciplinary KBD. What follows is a summary of the foundational elements of the *Knowledge-based Value System* approach which leads to the construction of k-capital systems (Carrillo, 1998, 2001).

First, the *relational* nature of knowledge is emphasized: it constitutes an event rather than a mere object or record. This realization is parallel to the crisis that modern physics experienced by "de-materializing" itself. It needs not imply a dualism. It involves an epistemological shift from matter-centered to relation-centered. It sets the ground for a continuous, homogeneous ground between "physical" and "knowledge" capital, *i.e.*, between material objects and their representations. Indeed, it is difficult to see how KM and KBD could rest on any rational grounds -including how "intellectual capital" and

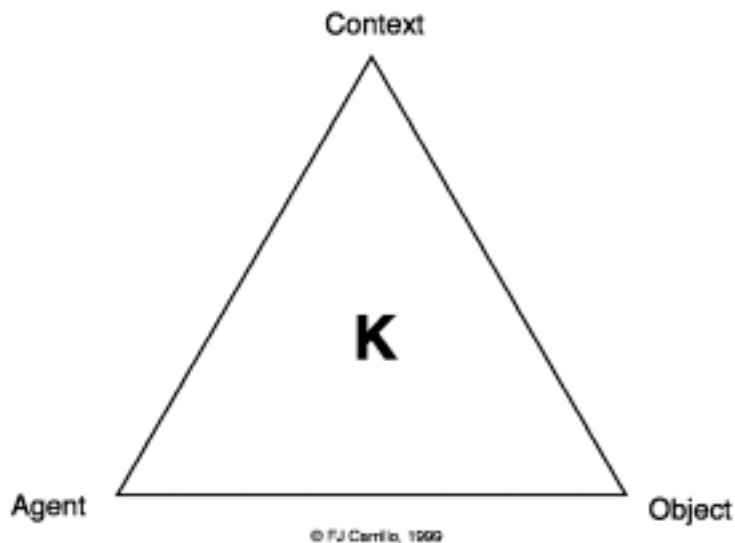
"stock of knowledge" can acquire managerial and political significance- unless such natural continuity is established.

This opens a search for the basic elements in a "k-event" (Figure 2). First, there is the most obvious, one with which most people identify knowledge: the k-object or *that which is known*. K-objects can be things, representations of things (images, words), people, events; actually any portion of the perceived universe.

Second, there is the k-agent: *her/him who knows*. Agents in a k-event can be human individuals, groups, and arguably animals, automata and extraterrestrial life forms. Let us stay for the time being with individual humans and groups. An agent /object interaction must take place, but that is not enough for a k-event to happen.

Third, there is the k-context which provides significance, *i.e.*, selects a specific agent/object interaction from potentially infinite possibilities. This element has a referential nature, *i.e.*, constitutes a value or a preference criterion.

Figure 2 Three components of a knowledge event



Thus, the necessary and sufficient elements for knowledge to take place are: an object, an agent and a context, all of which must be "process capable", *i.e.*, have the qualities that enable a particular k-connection to occur. For example, all objects must be perceivable; all agents must be active and all contexts must be discernible.

In a simplified sense, all KM, including KBD, involves the identification of relevant values, agent and objects in a system and their alignment. In mainstream KM, not all three aspects have been given due attention. During the initial years (early 1990s), most

KM practice focused on object-management activities such as yellow pages, document management, organizational memories, and other archival, bibliographical and IT tasks.

As early k-managers learnt, adequate user interface, motivation and skills were critical for the effectiveness of k-bases. During the second half of the 1990s, the transactional aspects of k-agents and objects, such as k-transfer, collaboration, *etc.*, received increasing attention. Hence, flow-cycle second-generation KM models gained prominence.

Up to this point, value is attributed to knowledge in terms of its accumulation (as in organizational memory) and distribution (as in shared practices). Stocking and circulating become the mechanisms for capitalizing on knowledge. Until the third element of k-events, context, is taken into consideration.

Context is the element that grants semantic status to a k-event. The economic significance of knowledge does not become apparent until an agent/object interaction is framed in a value context. Take any k-object (a treasure map, a company memo, a technique description) and give a competent agent (*e.g.*, one proficient in the language in which the object is recorded) access to it. Unless that agent has enough contextual elements to adequately interpret the object and determine the proper course of action, the value realization of that agent/object interaction will be impaired.

Hence, the first and most critical task for managing knowledge is to determine and operationalize the value framework of the systems whose capacity to attain its goals are to be maximized. Value alignment become the primordial KM function. Once the value framework is expressed into a manageable structure -the capital system- the other two components of k-events can be adequately selected, developed and assessed.

From this perspective, the plethora of available KM definitions can be organized into three families. Each family is recognizable in terms of: a) what is to be managed (the nature of knowledge); b) what is to be maximized (the nature of management); and c) what is the consequent approach (the nature of KM). Whereas there is a sequence in this evolution, these three families have coexisted, albeit in very different proportions.

Object-centered KM was from the start, and still is, quantitatively dominant, but decreasing in proportion. Agent-centered KM is emerging with great strength and advancing rapidly. Context-centered KM, even if anticipated in some early contributions, only now is becoming a true alternative. Each subsequent family has subsumed the former elements.

Table II shows how each family can be identified according to the aforementioned features: concept of knowledge, capitalization process and KM definition. This categorization implies no value judgement as to which approach is "best" in an absolute sense. Each approach capitalizes on specific attributes of a k-system and is therefore valuable in specific circumstances ("situational KM").

Table II Three families of KM approaches

<i>Family of KM approaches</i> Feature	<i>Family I: Objet-centered</i>	<i>Family II: Agent-centered</i>	<i>Family III: Context-centered</i>
Knowledge concept	Record	Flow	Alignment
Capitalization process	Keeping and accumulating stock	Facilitating and increasing circulation	Attaining sustainable value balance
KM definition	KM is a tool for identifying, storing, keeping, organizing, and retrieving the organization's k-base	KM is a method to identify, codify, structure, store, retrieve and diffuse experience	KM is a strategy to identify, systematize, and develop the organization's value universe

© FJ Carrillo, 1999

A context-centered approach aims at expressing all significant forms of capital, including object-capital and agent-capital. Therefore, this approach involves the following three core KM processes² :

Alignment and strategic consolidation of capitals. Determining, systematizing, and operationalizing the value universe of an organization.

Agent Capital Management. Determining and developing the value-generating capacities of productive individuals and teams, as well as those of the organization as a whole.

Instrumental Capital Management. Determining, implementing and developing the optimal array of conditions and resources to leverage the value yield of all elements in the organization.

These three KM processes and families of KM approaches can be related to identifiable KBD policies as follows,

1st-level KBD

Distributing Instrumental Capital

Most KBD strategies start by focusing on the most immediate area of impact: the instrumental base that would enhance the capacities of productive agents. An example of this is the World Bank's *Global Knowledge Partnership*, which is committed to ... *"sharing information, experiences and resources to promote knowledge and information*

² Detailed disaggregation available at the CKS website

as tools of sustainable, equitable development through information and communication technologies (ICT)" (see GKP website).

In its charter, GKP claims: *"Access to information and knowledge is essential if the disadvantaged, the marginalised, and the poor are to improve their lives and the lives of their children. GKP Partners believe that given the opportunities to access and use ICT, people can improve their economic well-being and empower themselves and their communities to participate in and be responsible for their own development. Mutual prosperity gained through effective use of information and knowledge would contribute to a more stable and equitable world" (ibid.)*

The contribution by Robin Mansell to this special issue assesses the evidence and lessons learnt in leveraging development through instrumental capital through ICTs. Nath (2000) emphasizes the role of ICTs in building k-societies. The forthcoming ITU *World Summit on the Information Societies* in 2003 will assess the global situation regarding ICTs (ITU, 2002).

2nd-level KBD

Developing Human Capital

One of the earlier lessons learnt by major development agencies was how ineffective mere fund allocation was in promoting development in more depressed economic regions. Such capital flow involved a dual perversion of purpose: lack of transparency in local fund management and profiteering by contractors, often from the same donating countries. The old Chinese proverb: "do not give fish to the hungry man: teach him how to fish" also gained increasing empirical support.

Human-capital KBD policies are now strongly favoured by NGT. Education, self-managed learning, technology transfer, expertise assistance, experience sharing and other forms of k-flow are now a central issue in development programs. The Report by Gemmill (1997) provides an excellent account of Human Capital in NGT, with special reference to Higher Education in the UK.

Working examples of this policy approach are the WB's *Global Development Learning Network* (GDLN) and the UN's *Science and Technology for Development Network* (STDev). Highly flow-centered, these programs move towards the attributes identified above: *k-based, distributed, collaborative and global*. While GDLN's mission is... *"to harness modern technology – including interactive video, the Internet, and satellite communications – in a cost-effective way, so that people who know are brought together with those who need to know, to learn with and from each other about the full range of development issues"*, the STDev defines itself as *"a gateway to information on activities in the area of science and technology for development within the UN system, other multilateral and bilateral development institutions and NGOs"*.

3rd-level KBD

Developing Capital Systems

When it gets to value-based KBD, we can make reference to some ideal specs (those identified above), and to a vision, but to no actual instances. A Global Capital System that is *complet, consistent, systematic and inclusive* is the framework for the Global KBD we seek. There are, though, several efforts which constitute steps in that direction.

The concept of *Moral Capital* has a tradition in the history of thought. Recently, Kane (2001) has used it to describe a form of asset of politicians and nations. Indexes to assess moral capital are becoming fashionable. Corruption indexes, for example, are being used to benchmark the reliability of public administration at regional and national levels as a key productivity factor and a determinant of the degree of investment qualifications. Transparency International is a non-governmental organization, "*dedicated to curbing both international and national corruption*". It generates a *Corruption Perceptions Index* (CPI) to make governments and transnational operations more accountable for corruption.

Most of these efforts tend to patch traditional economic and accountancy methods in view of their increasing incapacity to determine individual, organizational and social wealth. These "new measures" usually tend to complement the *hard* traditional measures with some form of *soft* addendum. What we get is a compound of heterogenous indicators carrying different axiological assumptions, defined within different theoretical frameworks, obtained through different methodological rules and compiled under an inevitable umbrella of eclecticism. This circumstance, as we will see later, pervades current practices to determine k-capital at individual, organizational and social levels. While such gross comparisons may be of use at some early point, they cannot be the basis for a systematic development strategy.

At the individual level, Emotional Intelligence emerged as a complement to traditional IQ measures. At the organizational level, Intellectual Capital constitutes mostly an addendum to *real* accountings. At the international level (not yet a global one), a new and growing branch of soft or k-based benchmarks is getting wider recognition. *Fortune Magazine* has added profiles of *Most Admired Companies* and *Best Companies to work for* to its traditional *Fortune 100* and *Global Fortune 500* listings. In the US, the *Metropolitan New Economy Index*, developed after *The New Economy Index* and *The State New Economy Index* sponsored by the Progressive Policy Institute, is part of a program aimed at developing "*a new set of economic indicators to illustrate the structural foundations of ... the New Economy*".

Probably the most extensive exercise in accounting for k-capital in the international arena is the WB's *Knowledge for Development* program. The KBD framework and policies are set in the *World Development Report: Knowledge for Development* (WB, 1998), with the objective to aid developing countries "*to exploit the knowledge revolution to help reduce poverty and promote sustainable development*".

Particularly relevant in terms of k-capital, the *KforD* program includes a k-assessment method and studies in specific countries aimed at developing national k-strategies. The assessment method generates "k-scorecards" consisting of 15 variables related to performance indicators (annual GDP Growth and Human Development Index), as well as to the four core aspects of the KBD framework: *institutional regime, education and training, innovation system, and information infrastructure*.

Still, the *KforD* framework is aimed at client nations. Nevertheless, the lessons learnt through its evolution will contribute to a better understanding of what it may take to build a global capital system.

A further recent development contributes to global capital from a different angle. This is the attempt by some of the international development agencies to define "global public goods" (GPGs). A GPG is one that *"must be supplied through the joint effort of nations or international agencies, beyond a single government and that constitutes a benefit for the inhabitants of the whole planet"* (Carrillo, L., 2002). The UN Program for Development (UNPD) distinguishes three kinds of GPGs: *natural ones*, such as the ozone layer or the atmosphere; *man-made* such as universal norms and cultural baggage; and *political ones*, such as international market efficiency, financial stability, security and peace, environmental sustainability and health. (*ibid*). This important development initiates the collective capitalization of *the global commons*. But it is still different from the concept of *a system of global capital*, which would include *the value universe* of our planet, including all forms of value currently possessed or managed by any individual entity, those that are managed jointly through some form of cooperative alliance and those which so far are not claimed or managed by any identifiable entity. Only such a domain would correspond to the *complete, consistent, operational and inclusive global capital system* we are seeking to develop.

In the next section, the evolution of the KM area of Intellectual Capital is analyzed from the normative perspective of these four requirements. The introduction of the capital system approach suggests some new directions for IC.

Capital Systems

The taxonomy phase of IC

As mentioned earlier, one of the economic drives for the fast expansion of the KM movement was the realization of the weight of intangible assets in companies, particularly public ones. The huge economic implications of this realization led to an *intellectual gold rush* aimed at identifying, measuring and capitalizing on such *intangibles*. As in the early stages of other conceptual fields, efforts have been predominantly inductive, resulting in arbitrary collections of IC "indicators". The variety of IC models and categories has been documented, (e.g., Flores, 2000; Sullivan, 2000; and Bontis, 2001). More often than not, such arrays are *circumstantial* (non-systematic) and, hence, *heterogeneous* (with a mix of dimensions from different planes). One discovers that when attempting to value IC, very few of those arrays abide by basic canons of metrology. Even fewer differentiate a k-based value dynamics (e.g.: Thoreson and Blankenship, 1996). While IC has become one of the most fertile areas of KM, to what extent the basic dimensions describing k-based value generation have been grasped remains an open question.

Productive value structures

The evolution of production systems throughout history may shed some light on the nature of k-based value systems. Although a production system is not exclusively one aimed at increasing the stock of goods, services and exchange capital, we will refer mainly to these for the time being. Production systems aiming at furthering aesthetic, epistemic and ethical value do include mechanisms for such enhancing or development. Such mechanisms, common to all value systems, will be identified as a *production function*.

Hence, looking at how humans have organized throughout history in order to obtain a positive differential of goods, services, investments and savings at the end of a working cycle, we recognize how productive systems have evolved. Nomadic tribes, by far the longest prevailing form of human society, were based on hunting-gathering. Under that scheme, a bare minimum of tools was kept to maintain effective and efficient hunting, collection and other basic life-preserving and community building functions. Oral tradition was a dominant mechanism for preserving knowledge and transmitting it from generation to generation. (Ives, Torrey and Gordon, 1998),

The emergence of human settlements is associated with the advent of agriculture, and was to become the dominant production system for a few millenia, coexisting with remanent forms of hunting and gathering. In agricultural societies, land was a prime capital, inputs such as water, seeds and fertilizers, very important and productivity formulas, a relatively invariant technological stock. The agricultural cycle provided

landmarks to cultural and religious frameworks. Recorded symbolic language became a vehicle to knowledge, with the advent of the printing as epythome.

The degree of penetration and transformation of the natural landscape increased as productive systems evolved. From surface-bound hunting-gathering to land manipulation and landscape transformation in agriculture, human incidence on nature deepened. Extraction of natural resources, which started as nomadic tribes moved along territorial paths, increased as urban settlements allowed for more powerful tools and techniques. The combination of agriculture with extractive production and compatible hunting-gathering prevailed for most of documented history.

In the scale of human history, modernity has just happened. One of its more significant outcomes, the industrial revolution, under such a time scale, is right before today. At that critical point, production systems undergo a major change. Extracted raw materials and energy are transformed through mechanical and chemical processes, using machinery and equipment to generate manufactured goods. Technology begins to change at an accelerating rate. The value added of manufactured goods supersedes that of agricultural production. Commercial mobility increases reaching today's vertiginous flows of goods, services, financial capital, and technological innovations at a global scale.

As modern Economic Science took hold, it became concerned with the way in which production factors combine into the most effective and efficient arrays. What the necessary and sufficient production factors are for a given system is a question that Economic Theory of the Firm addresses. Through dynamic systems modelling, k-based alternatives to business design and development are being explored (e.g.: Guevara, 2002).

Contemporary Theory of the Firm is a child of industrialization. It responds to the logic of production which is connatural to manufacturing. Even service industries are conceived under the same fundamental logic. Certainly, many issues which could be associated with k-based production have been addressed by recent economic analysis, but only marginally. The dominant economic rationale is still founded on the distinctive value dynamics of mechanical and chemical transformation of matter and energy and the associated hierarchy of human labour, management and investment (Cyret and March, 1992).

K-Based value structures

Certainly, there are continuities in the transition from material-based to representational-based production, as there were from hunting-gathering, to agricultural, to industrial societies. Economic phenomena are a manifestation of a combinatory of objects, agents and contexts. Economic principles are an abstraction of such a combinatory. Physical and chemical conditions inextricably constrain that combinatory, determining possible economic outcomes. In general, the properties of underlying natural phenomena predetermine the economic behavior of production systems.

Continuities in economic processes from industrial to k-based production are bound to happen insofar as material elements are involved and they do not get subsumed by k-processes. Human labour as production factor will behave in the same way it has as long as it is regarded primarily as a mechanical, muscle-bound activity. Even work in the service industry will be similarly regarded insofar as it is measured in traditional output units.

But there are also discontinuities in the economic behavior of production systems once the predominant factors are representational or k-based. Indeed, this is the very *raison d'être* for KM and for the whole spectrum of k-based development. How old and new factors will combine is an open question. While some of the most visible characteristics of the k-based economy have been pointed out (Choi *et.al*, 1997; Woodwall, 2000; OECD, 2001; The European Commission, 2001,) they still need to be formally structured and empirically tested. Beyond those currently under debate, received concepts such as intellectual property and the capital/labour dichotomy need revision.

The bet on the distinctiveness of k-production factors rests on the physiological, psychological and social strata of k-events. While there are causal interdependencies between material and represented objects (as there are between physical, chemical and biological processes) there are also behavioral patterns idiosyncratic to each level. Once we enter the domain of represented objects or events, the combinatory is singular and as a consequence so is the spectrum of economic outcomes. This is the main point. For the purpose of the overall argument it is enough to raise such a possibility. What exactly are those natural differences and how they determine economic outcomes is a major question which we are only beginning to grasp.

Metaproductive organizations and the global society

Production was identified above as a generic function of all value systems. Such a function aims at preserving and enhancing the total worth of the system. "Worth" does not necessarily mean an increase in size or an accumulation, but a preferred state relative to a specific value structure.

Economics, as we know it, has accounted basically for the production and distribution of material resources and their financial representations. The production component, in its most irreducible structure (an input/process/output model), involves: an *investment income*, an *agent*, an *instrument*, and an *outcome*. Table III compares major production systems throughout history along these categories. Early service industries are regarded as transitional into the knowledge economy and, hence, not differentiated in this comparison.

Table III Dominant factors of major production systems

	Input	Process	Output
--	--------------	----------------	---------------

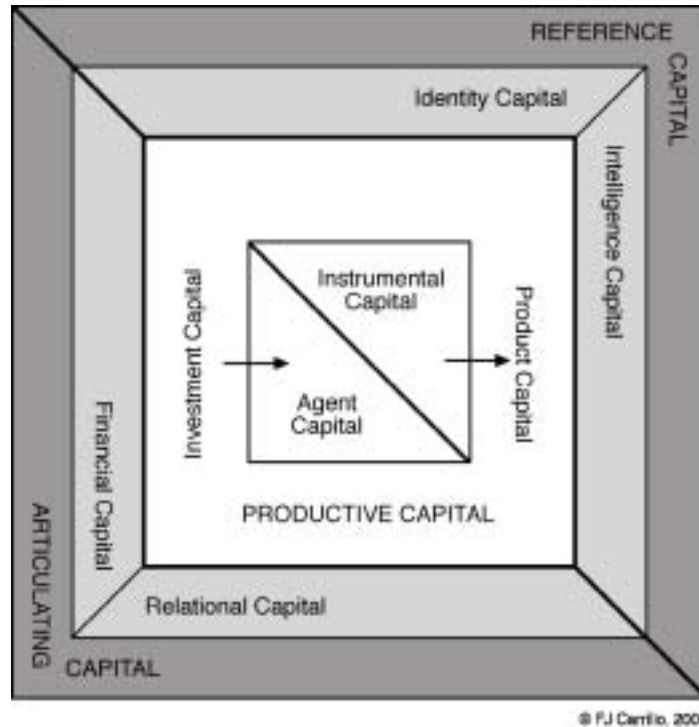
		Agent	Instrument	
Hunting gathering	Natural habitat	Human	Hands and primitive tools and techniques	Game, fish and collected natural goods
Agriculture	Land, water, seeds, fertilizers	Human and animal	Agricultural equipment and techniques	Agricultural goods
Industrial	Raw materials and energy	Human and automata	Industrial machinery, equipment and techniques	Manufactured goods and industrialized products

© FJ Carrillo, 1998

As the output of production systems needed to be represented for practical reasons, currencies and records were developed. This alone multiplied the value combinatory of material products. Thus, material production systems generated a form of *metacapital*, one which served as representation of all other forms of production value and allowed for its quantification, recording and exchange. This combination of material and financial capital has been the dominant realm of economics.

Once "represented" or "k-based" production factors became increasingly relevant and the *Intellectual Gold Rush* exploded, the need for not only a new structure of production factors, but also of its combination rules became apparent. Figure 3 shows a generic arrangement of such factors, followed by their definition. Whereas any of these can include k-capital, the best identified forms (internal elements) are still related to production capital, such as instrumental (mostly, k-objects) and agent (mostly, human competencies). The most elusive or ignored so far are new *metacapitals* (external elements), those which are not directly productive but which determine the overall productivity of the system. Amongst these, two major categories emerge: *referential* and *articulating* capital. The first has a function to focus and align, like a compass or lighthouse. It includes endogenous (identity) and exogenous (intelligence) capital. *Articulating* capital has the function of interconnecting all other forms, like glue or cement. It includes financial (the first form of metacapital) and relational capitals.

Figure 3 A Generic System of Capitals



Generic Capital System Definitions

Generic Capital System

The taxonomy of a system's value categories

Metacapital

Referential Capital (Value elements which allow the identification and alignment of all other value elements)

- Identity Capital (endogenous value referents)
- External Intelligence (exogenous value referents)

Articulating Capital (Value elements which allow the interconexion or exchange amongst value elements)

- Relational Capital (interaction status amongst significant agents)
- Financial Capital (monetary expression of some or all value elements)

Input Capital

Investment Capital (Value element from another system which is brought in as an input)

Production Capital

Agent Capital (Those value-generating capacities of individuals -animal, human and automata- and their groupings, as well as those from the organization as a whole to improve its own performance)

Instrumental Capital (The means of production through which every other capital leverages its value-generating capacity)

Output Capital

Product Capital (The inventory of values generated by all other value elements which has not been realized yet in another form of capital)

Were we able to capture completely and consistently the capital system of any given entity, we would be representing its "value blueprint", the state of the system with reference to its ideal state. Such an ideal state would be one where each of the value elements existed just in the right proportion to achieving full balance. Hence, value systems are unique, as unique as personalities or cultures. And, therefore, capital systems are as diverse as the multiplicity of systems amenable to a singular description. This would apply to every individual, every organization, and every society.

The emphasis on metaproductive values helps us understand that production does not have primacy in all systems. Indeed, no single form of value has primacy: it is only the perfect equilibrium of all value elements (whatever their relative weights) that becomes an ideal for probably all systems.

From a planetary perspective, the challenge becomes one of identifying the value universe for all stakeholders and achieving the best possible balance. A Global Capital System can provide a platform to construct planetary value propositions.

Capital Development Strategies

Much aid about nothing

The writing of this paper coincided in time and space with the UN Conference on Financing for Development (Monterrey, March 2002). Despite much diplomatic ado, it was clear well before that no significant agreement could be reached at the conference because there was a prior agreement that no further consensus would be sought beyond an earlier draft which introduced no structural modification to current affairs.

Even if effective Aid For Development (AFD) schemes were actively sought by UN members, it is difficult to see what such schemes could be as long as national perspectives prevail. Until structural problems in north-south capital flow, such as the perpetuation of debt and the international commodities pricing scheme, are addressed from a supranational perspective, there is little hope for change. An example of a

supranational, although still limited perspective, was that adopted by The European Community, each member state should allocate at least 0.35 % of its GDP to AFD.

From this perspective, the relatively modest UN Millenium Goal of increasing AFD to 0.7% of GDP in all developed countries looks remote. The EU has the highest rate so far and the US's is below 0.1%. There has been substantial debate over the conditions that receiving countries should guarantee in order for aid to have a positive impact. Even if those conditions were met, even if the UN goals on aid were met, it is unlikely that the geography of global financial capital would reach a sustainable balance.

Current imbalances are manifested in a more substantial south-north capital flow than north-south. Under this perspective AFD becomes irrelevant. The scarcity of funding for development is bound to continue under the prevailing national, non-systemic and dependency-generating scheme.

Whether there are any funding alternatives is a question that acquires direct significance to KM from a capital systems perspective. Under the current scheme, individual industrialized countries struggle internally to allocate so much funding to AFD, systematically falling short of UN goals. At the same time, developing nations get locked into an insufficiency trap. The question is twofold: *a) are there any AFD schemes that can overcome the current financial trap? And b) can these schemes be enriched from a knowledge-based, capital systems perspective?* In sum: *can the capital systems approach provide an alternative to k-based development?* In the following sections, several dimensions are explored which suggest it can.

Capital dimensions

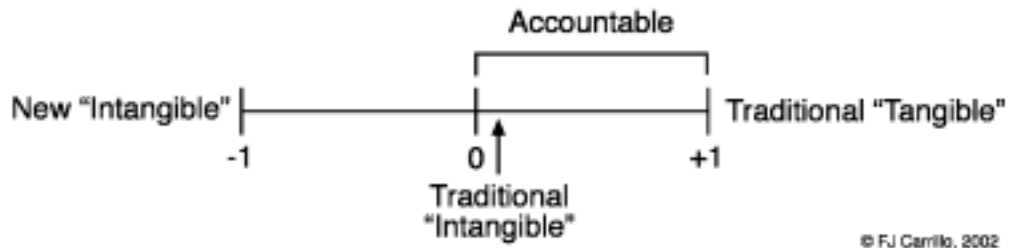
The prevailing Financing for Development rationale is based on fractions of surplus industrial capital from developed countries being donated to developing countries. Alternatively, the capital systems rationale focuses on the following questions: *a) how can individual developing countries identify and balance their distinctive value structure? and b) can developed countries do something to help themselves advance towards that goal?* The possibility that the first question is not merely rhetorical rests on some as yet untapped potential of human capital systems.

Financial AFD is a byproduct of the production and financial capital characteristic of material economies. It will always be competing with other internal priorities. The US, by far the wealthiest industrial economy, devotes several times less to AFD than what it spends on curing excess-consumption-related diseases.

The only chance for KBD is to find alternative sources. That alternative may well be in those capital dimensions which remain untapped and in new flow options. To begin with, the basic realization of the Intellectual Capital movement can be brought to the social level: the total developmental potential of a nation is above that of its current economic

output. The challenge is to identify all forms of new k-capital and bring them into the realm of accountable and actual value (figure 4).

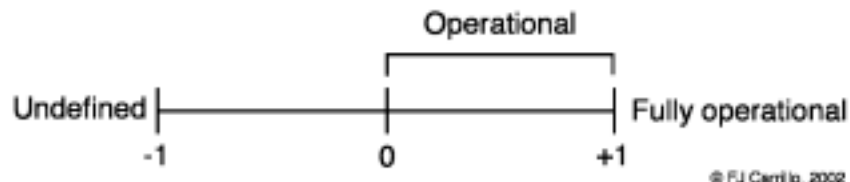
Figure 4 Capitals by regular accountability



© FJ Carrillo, 2002

Actually, there is a precondition for any form of capital, regardless of its status, to become accountable and manageable. In fact, identifying "unrealized capital" does not make it manageable or even a potential asset. It could actually be a potential liability. Until any capital is operationalized, in the scientific sense (i.e.: Bridgman, 1927; Feigl, 1954; Carrillo, 1983), it cannot be regarded as manageable. An operational capital is one which is defined in terms of how we actually identify and compare it. That can be, for example, the consensus of three experienced supervisors. Customer loyalty can mean many things. For some, it is ... "a favourable predisposition to buy again". Others suggest anything from rate of reincidence to customer's NPV. Reichield (1996) has constructed a hierarchy of customer loyalty measures which indicates the most appropriate index for each use. Operational capitals move along the scale as they become better understood and defined, very much as concepts in other areas of human understanding have evolved (figure 5).

Figure 5 Capitals by degree of operationalization



© FJ Carrillo, 2002

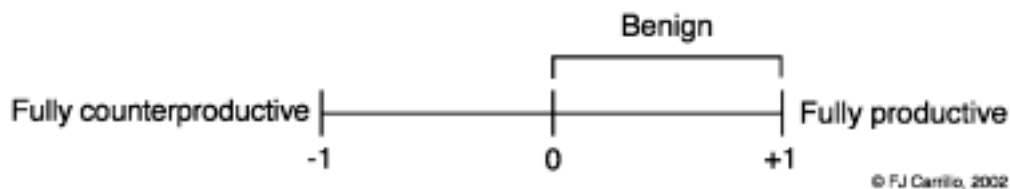
The domain of accountable and manageable capital is that of operational capital, regardless of its status in traditional accountancy and management. We can think of total capital as the mass of an iceberg, where that part traditionally accounted for is the tip above sea surface

Operational capital attributes

All operational capital has three dimensions which jointly determine their net worth. These are *productivity*, *functionality* and *availability*. These dimensions are expressed in positive and negative magnitudes. Any capital can be assessed in terms of its net worth as a product of the combined value of these three dimensions. Each is described next.

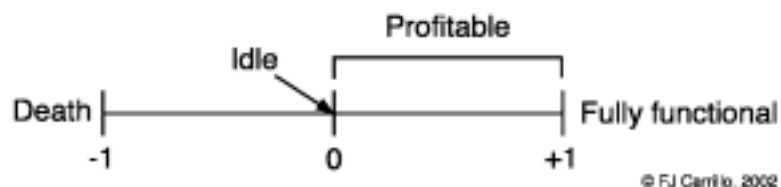
Productivity. Not all capitals are benign, since systems may be better off without some such capital (*i.e.*: a "white elephant"). Efficacy refers to the extent that any capital actually improves the worth of the value system, *i.e.*: adds to its positive contributing factors. All capitals carry an ownership cost which should always be less than their total worth if they are to be regarded as positive (figure 6).

Figure 6 Capitals by degree of productivity



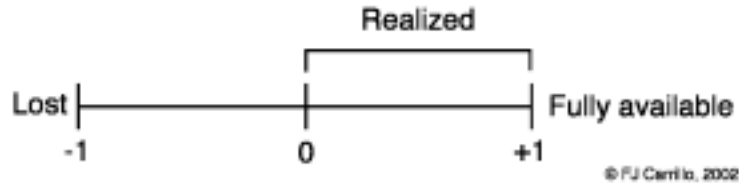
Functionality. Capitals can be of more or less worth but that worth can be attained with different degrees of efficacy. A capital may have real worth but be an idle or even in a death condition. They can also become obsolete or out of season. Only fully functional capitals deliver their total worth. All functional capitals are productive capitals. Productive but idle capitals do not deliver their worth, but they may, if put to work. Death capitals are those that are beyond any possibility of becoming productive (figure 7).

Figure 7 Capitals by degree of functionality



Availability. Productive and functional capital may become lost by accident, neglect or premeditated action. It can also be out of reach (*e.g.*: databases for which the access path or access code is forgotten or unavailable). Access cost diminishes net worth (figure 8).

Figure 8 Capitals by degree of availability

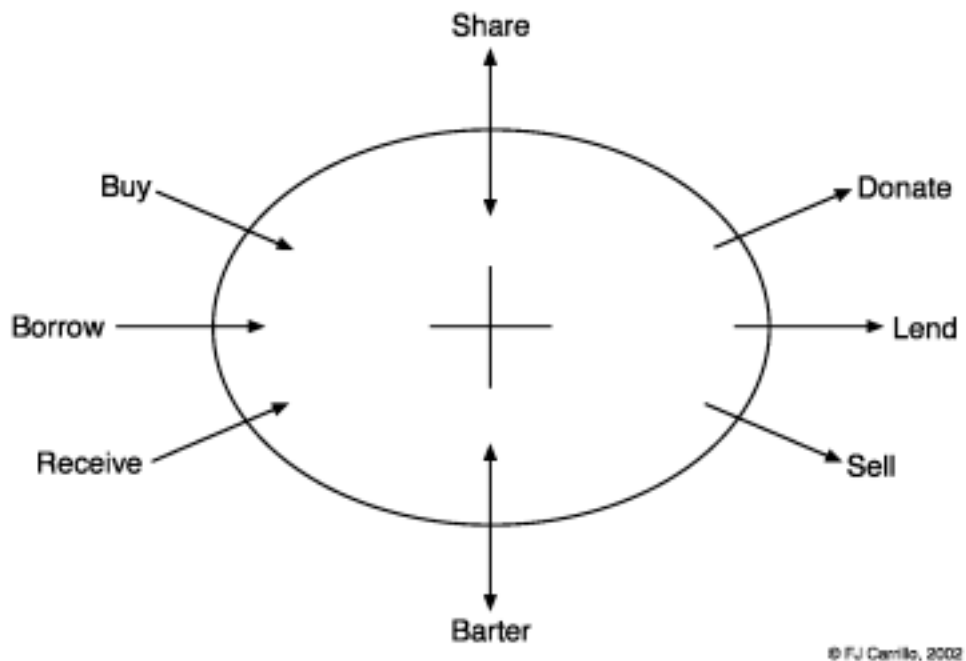


NPV and NAV. The Net Potential Value -NPV- of a Capital System is the total worth that it is capable of achieving. The Net Actual Value -NAV- of a Capital System is the total worth that it has actually achieved. $NAV = NPF$ if and, only if, each of the capital components is fully productive, fully functional, and fully available (including evolutionary elements).

Capital strategies

Once the distinctive dimensions of k-capital systems are eventually understood, a new combinatory of developmental factors may emerge. Until now, the received view focuses on two possibilities: borrowing fresh funds or receiving them as aid. Yet, there are a number of other capital flow options, beyond the unidirectionality of current flows. Figure 9 shows some such possible flows, several of which can be reciprocal or cooperative.

Figure 9 Some capital flow options



While specific policy priorities may differ across countries, The New Economy: Beyond the Hype encourages governments to adopt a comprehensive growth strategy based on a combination of actions in order to:

- 1. Strengthen economic and social fundamentals, by ensuring macroeconomic stability, encouraging openness, improving the functioning of markets and institutions, and addressing the distributive consequences of change.*
- 2. Facilitate the diffusion of ICT, by increasing competition in telecommunications and technology, improving skills, building confidence and making electronic government a priority.*
- 3. Foster innovation, by giving greater priority to fundamental research, improving the effectiveness of public R&D funding, and promoting the flow of knowledge between science and industry.*
- 4. Invest in human capital, by strengthening education and training, making the teaching profession more attractive, improving the links between education and the labour market and adapting labour market institutions to the changing nature of work.*
- 5. Stimulate firm creation, by improving access to high-risk finance, reducing burdensome administrative regulations and instilling positive attitudes towards entrepreneurship.*

The World Bank (1998) identifies the following lessons learnt:

The Report suggests three lessons that are particularly important to the welfare of the billions of people in developing countries.

First, developing countries must institute policies that enable them to narrow the knowledge gaps separating poor countries from rich.

Second, developing country governments, multilateral institutions, nongovernmental organizations, and the private sector must work together—to strengthen the institutions needed to address the information problems that cause markets and governments to fail.

Third, no matter how effective these endeavors are, problems with knowledge will persist. But recognizing that knowledge is at the core of all our development efforts will allow us to discover unexpected solutions to seemingly intractable problems.

To conclude this KBD policy analysis, the following remark by John DeLong seems appropriate: *There is no basis for the often-heard claim that countries must learn to live with rather than try to change their long-run growth trend, and every reason to think that*

pro-growth policies can nurture--and anti-growth policies destroy--long-term economic growth. (1996)

Towards Global KBD

From a Global Capital perspective, the following are some of the most evident lines of KBD policy transition:

From industrial to K-Based . Every entity, regardless of its current developmental status (industrialized, non-industrialized, etc.) , must embrace a KBD perspective. In fact, not all of the richest economic entities which built their might under the industrial production ethics will automatically become the wealthiest under a capital systems perspective.

From non-operational to fully operational. All systems must advance in the understanding and measurement of their constituent values.

From dependence through self-reliance, to interdependence. Each developing entity must undertake responsibility for its own development. Aid should become more facilitating and less intrusive.

From exogenous through endogenous to systemic. Individual entities must seek their own identities and establish positive transactions with other entities.

From counterproductive to fully productive. All existing capital must be turned into a positive development factor.

From idle to fully functional. All existing capital must be made productive to its full potential.

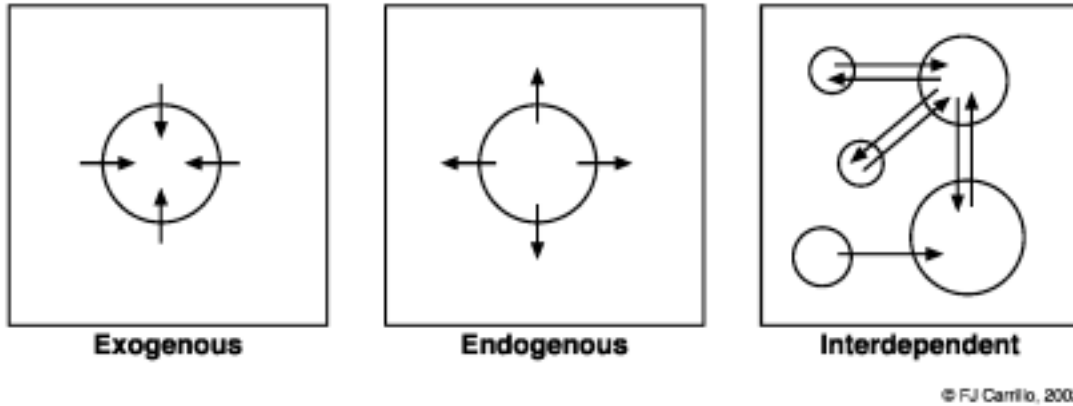
From unrealized to fully available. All existing capital must become accessible.

From national to planetary. All development efforts must be conceived within the proper system coordinates to multiply their developmental impact: individual, community, local, national, regional, continental, multinational, planetary.

From linear to systemic. All development policies must consider not only the immediate and most apparent impacts, but also look at broad longer-term pattern of interdependencies.

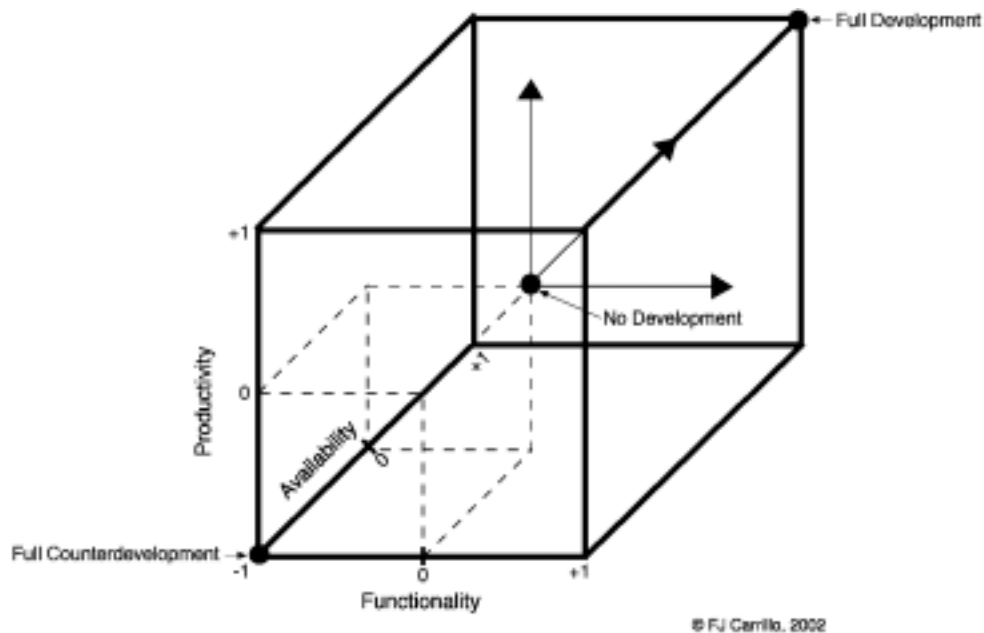
Figure 11 shows the progression from merely exogenous to interdependent capital flows.

Figure 11 Sources for *financing* KBD



Eventually, these policy elements may converge in a systemic, multidimensional space of capital development which is applicable to all individuals, organizations and societies (Figure 12).

Figure 12 Capital systems levels



Although there is a long way to go to formalize capital systems and their applications to individual, organizational and social KM domains, right now diverse entities are helping to advance clarification of the value framework and understand how each of its constituent elements is contributing (or not) to making it what it aims to be. At the global level, it may help to achieve greater accountability and transparency in the way in

which major constituencies (individual nations, international agencies and multinational corporations) contribute to planetary worth. This is one of the goals of the World Capital Institute.

Conclusions: a Global Capital Agenda

The Sciences of Development

A systematic approach is required to build a consistent KBD framework. Capital systems, a framework common to KM and PKM, has been provided to instantiate such an approach. However, this is not a linear task. There are no absolute grounds to prove it is even a desirable one. The viability and moral adequacy of the program outlined here is open to question. Some contemporary ideas actually clash straightaway.

Blunden (1998), for example, looks at the very relation between knowledge and value as an ethical and epistemological axle of modernity and its unsustainable outcomes. Baudrillard (1991), in what could be described as the ultimate social entropy, considers that value itself has become a meaningless category:

All these ups and downs take us back to the destiny of value... After the natural phase, the commercial phase, and the structural phase, the fractal phase of value has arrived... In this fractal phase there is no equivalence anymore, neither natural nor general, one cannot really talk anymore about the law of value, there is just some sort of value epidemic, of general value metastasis, of proliferation and random dispersion. To be precise, we shouldn't talk about value anymore, since this kind of de-multiplication and chain reaction preempts any kind of evaluation.

Jean Baudrillard: *The Transparency of Evil*³

As a matter of fact, if Baudrillard proves right, the whole program advanced here would be meaningless. On the other hand, the only way out suggested by Baudrillard himself is one with which this KM approach concurs: a new account of *alterity*. Alterity is essentially a way of looking at *the other* not as him/her who exists independently of us, but as the very source and final destiny of ourselves (Bajtín, 2000). The ethos of alterity may also be the only conceivable one through which the articulation of a global capital system and the eventual emergence of a global consciousness can result.

Perhaps the very confrontation with the limits of globalized modern culture may help mankind utter for the first time its collective identity and destiny. It seems worth betting on the viability of the deconstruction of our axiological and epistemological inheritance

³ My translation from the Spanish version

(Ferré, 1998) and the subsequent articulation of an elementary grammar of value at once diverse and global.

References

- Aghion, P. and Howitt, P. (1998), *Endogenous Growth Theory*, Cambridge, Mass., and London: MIT Press
- American Heritage Dictionary of the English Language, The, (2000), *Fourth Edition*, New York: Houghton Mifflin
- Amidon, D. *The Innovation Superhighway: Harnessing Intellectual Capital for Collaborative Advantage* (forthcoming).
- Barrientos, X. (2002), "Diseño de una estrategia de desarrollo universitaria basada en sistema de capitales" Doctoral dissertation, UV, Tecnológico de Monterrey, in progress
- Bajtín, M. (2000), *Yo también soy: fragmentos sobre el otro*, (T. Bubobna, Ed.), México: Alfaguara.
- Baudrillard, J. (1991), *La Transparencia del Mal: Ensayo sobre los fenómenos extremos*, Barcelona: Anagrama
- Bennis, W. (1997), *Organizing Genius: The Secrets of creative collaboration*, Addison-Wesley, p. 155
- Bhatt, G. (2002), "Management strategies for individual knowledge and organizational knowledge", *Journal of Knowledge Management*, Vol 6 No 1, pp. 31-39
- Bluden, A. (1998), "Knowledge and Value", Available <http://home.mira.net/~andy/works/index.htm>
- Bontis, N. (2001), "Assessing Knowledge Assets: A review of the models used to measure intellectual capital", *International Journal of Management Reviews*, 3, 1, 41-60
- Bridgman, P. (1927), *The Logic of Modern Physics*, New York: Macmillan
- Carrillo, F. (2001), "Meta-KM: A Program and A Plea", *Knowledge and Innovation: Journal of the KMCI*, Vol. 1, No. 2, pp. 27-54
- Carrillo, F. (1999), "The Knowledge Management Movement: Current Drives and Future Scenarios", *3rd International Conference on Technology, Policy and Innovation: Global Knowledge Partnerships - Creating Value for the 21st Century*, Austin, University of Texas, Available <http://www.knowledgesystems.org>
- Carrillo, F. (1998), "Managing Knowledge-based Value Systems", *Journal of Knowledge Management*, Vol 1, No 4, pp. 280-286
- Carrillo, F. (1983), *El Comportamiento Científico*, México: Limusa-Wiley
- Carrillo, L. (2002). Enfrentan rezagos desde globalización, *El Norte*, Monterrey, México, March 31, p. 5A
- Center for Knowledge Systems (2000). "Modelo de Estructura de los Sistemas de Capitales", *Manual del Diplomado en KM, Modulo 2: Sistemas de Capitales*, Monterrey: CKS
- Center for Knowledge Systems (1998), "Core KM Processes", Available www.knowledgesystems.org

- Choi, S. Stahl, D. and Whinston, A.(1997), *The Economics of Electronic Commerce: The Essential Economics of Doing Business in the Electronic Marketplace*, Indianapolis, IN: Macmillan
- Cyret, R., and March, J. (1992), *A Behavioral Theory of the Firm (2nd. ed.)*, New York: Blackwell Business
- DeLong, J. (1996), "Endogenous Growth: Economic Theory and Faster Growth", Available <http://econ161.berkeley.edu/OpEd/endogenousgrowth.html>
- Doz, Y., Santos, J. and Williamson, P. (2001), *From Global to Metanational: How Companies win in the Knowledge Economy*, Boston: Harvard Business School Press
- European Commission (2000), *Innovation Policy in a Knowledge-based Economy*, Brussels: European Commission
- Feigl, H. (1954), "Operationism in scientific method", *Psychological Review*, 52: 250-258
- Ferré, F. (1998), *Knowing and Value: Toward a Constructive Postmodern Epistemology*, Albany, N.Y.: State University of New York Press
- Fine, B. (2000), "Endogenous Growth Theory: A Critical Assessment", *Cambridge Journal of Economics*, 24 (2) pp. 245-65
- Flores, P. (2000), "Relación de enfoques y modelos de Capital Intelectual", *Guía del Módulo 2: Sistemas de Capitales, Diplomado en Administración del Conocimiento*, Monterrey: CSC.
- Fuller, S. (2001a), "Knowledge R.I.P.? Resurrecting Knowledge Requires Rediscovering the University", *TAMARA: Journal of Critical Postmodern Organization Science* Vol 1 (1): 60-67 , Pre-publication version available http://www.zianet.com/boje/tamara/issues/volume_1/issue_1_1/FULLERtamaraVol1No1.htm
- Fuller, S. (2001b), *Knowledge Management Foundations*, Butterworth-Heinemann / KMCI Press
- Gemmell, N.(1997), *Report 8: Externalities to Higher Education: a Review of the New Growth literature*, The National Committee of Inquiry into Higher Education (UK), Available <http://www.leeds.ac.uk/educol/ncihe/report8.htm>
- Global Knowledge Partnership (2002), *GKP webpage*, Available <http://www.globalknowledge.org/>
- Global Development Learning Network (2002), The World Bank, *GDLN web page* <http://www.gdln.org/>
- Goleman, D. (1995), *Emotional Intelligence*, New York: Bantham
- Guevara, D. (2002), "Modelo de Negocios Basado en Conocimiento a partir de la Teoría de la Firma", *Tesis de grado: Maestría en Administración de Tecnologías de Información*, Monterrey: Tecnológico de Monterrey.
- International Telecommunications Union, The World Summit on the Information Society, *WSIS Newsletter* No. 1, 2002, Available <http://www.itu.int/wsis/news/news01.htm>
- Ives, W., Torrey B. and Gordon C., (1998), "Knowledge management; an emerging discipline with a long history", *Journal of Knowledge Management*, Vol 1, No 4, pp 269-274
- Jones, C., (1998), *Introduction to Economic Growth*, W. W. Norton and Company, 1998

- Kane, J. (2001), *The Politics of Moral Capital*, Cambridge University Press
- Knowledge Management Consortium International (2001). *KMCI Certification*. Available <http://www.kmci.org/>
- Kurz, H. and Salvadori, N. (2001), "The 'New' Growth Theory: Old Wine in New Goatskins", Available <http://csf.colorado.edu/authors/Salvadori.Neri/growth.pdf>
- Laszlo, E. (1994), *The Choice: Evolution or Extinction?*, Jeremy P. Tarcher / Putnam
- Lelic, S. (2002), A wealth of knowledge: Realising the value of KM in the public sector, *The Knowledge Management newsletter*, 17th April, Available <http://www.kmmagazine.com>
- Nath, V. (2000), "Heralding ICT enabled Knowledge Societies way forward for the Developing countries", *Sustainable Development Networking Programme* (India), Available <http://sdnp.delhi.nic.in/resources/internetinfo/articles/heralding.htm>
- OCDE (2001), "The New Economy: Beyond the Hype", *Final Report on the OCDE Growth Project*, Meeting of the OCDE Council at Ministerial Level, Available, <http://www.oecd.org/EN/home/0,,EN-home-33-nodirectorate-no-no--33,FF.html>
- Pienaar, H., et al. 1999, "Organisational transformation at an academic information service" *Library Management*, 20(5): 266-272, Personal Knowledge Management web page, Available, <http://hagar.up.ac.za/catts/learner/heilap/knowmant.html>
- Progressive Policy Institute (2002), *New Economy Index, State New Economy Index and the City New Economy Index*. PPI website, Available http://www.ppionline.org/ppi_ci.cfm?knlgAreaID=107&subsecID=123&contentID=1268
- Progressive Policy Institute (1999), "Rules of the Road: Governing Principles for the New Economy". *New Economy Task Force Report*, Available http://www.ppionline.org/ppi_ci.cfm?knlgAreaID=107&subsecID=196&contentID=865
- Quintana, E. (2002), "¿Ricos o Pobres?", *El Norte*, Monterrey, NL: 21 de marzo, sección negocios
- Reichheld, F. (1996), *The Loyalty Effect*, Boston: Harvard Business Scholl Press
- Skyrme, D. (1999), "The Knowledge Networker's Toolkit", Chapter 5 of *Knowledge Networking: Building the Collaborative Enterprise*, Butterworth-Heinemann
- Smith, A. (1759), *The Theory of Moral Sentiments*. The History of Economic Thought Website. Economics New School, Available <http://cepa.newschool.edu/het/>
- Solow, R. (2000), *Growth Theory - An Exposition*, Second Edition, Oxford University Press
- The Science and Technology for Development Network (2002), STDev, *Technology for Development* Section, TEDB, Division on Investment, Technology and Enterprise Development, UNCTAD, Available <http://www.unctad.org/stdev/>
- Steedman, I. (2001) "On 'Measuring' Knowledge in New (Endogenous) Growth Theory", *The Growth Theory Conference*, Pisa, Italy
- Stewart, T. (1997), *Intellectual Capital: The New Wealth of Organizations*, New York: Doubleday / Currency

- Sullivan, P. (2000), "A brief History of the ICM movement", *Value-driven Intellectual Capital; How to convert Intangible Corporate Assets into Market Value*, Wiley, Page 238-244, Available <http://www.sveiby.com/articles/icmmovement.htm>
- Thoreson, J. and Blankeship, J. (1996), *Information Secrets: Metrics and measures for valuing information*, Richardson, Texas: Valuable Information
- Torres, Celina. (2002). "Transformación estratégica de un centro de investigación en una organización basada en conocimiento". Panel: Desarrollo de la Actividad Profesional en Gestión del Conocimiento y la Innovación, *Memorias del Congreso Nacional de la ADIAT 2002*, México: ADIAT
- Transparency International (2002), TI website, Available <http://www.transparency.org/cpi/2001/cpi2001.html>
- United Nations Organization (2001), "Making New Technologies Work for Human Development", *The Human Development Report 2001*, New York: ONU
- Villarreal H. (2002), "Sistema de Capitales en una organización gubernamental", *XXXII Congreso de Investigación y Extensión del Sistema Tecnológico de Monterrey*, Monterrey
- We, G. (1994), "What is Endogenous Growth Theory?", *A monograph for CMNS 840, Canada's Information Highway*, Available <http://oscar.cprost.sfu.ca/~we/misc/endogenous.html>
- West, P. (2001), "The Individual as a Brand", Copyrighted presentation, personal communication
- Wilks, A. (2001), "Development through the Looking Glass: the Knowledge Bank in Cyber-space", Paper presented at *The 6th Oxford Conference on Education and Development, Knowledge Values And Policy*
- Woodwall, P. (2000), (Ed), "Survey: The New Economy", *The Economist*, September 21st
- World Bank, The (1998), *Knowledge for Development: World Development Report*, Available <http://www.worldbank.org/wdr/wdr98/index.htm>