

## **KNOWLEDGE-BASED DEVELOPMENT OF CITIES AND SOCIETIES: AN INTEGRATED MULTI-LEVEL APPROACH**

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### **The Way Forward: Theorizing Knowledge-Based Development?**

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### **Background**

This volume introduces an important new social science - KBD, the knowledge-based development of cities and societies. It arises at the convergence of an urban planning tradition that, as Edvinsson reveals in our Foreword, goes back many centuries, with the economists' concern with knowledge as the factor of production whose predominance characterizes the contemporary world. We live, we are told, in the Knowledge Age, so it is not strange that we are looking for knowledge-based theories to illuminate our situation and guide our actions. History plays its own tricks on us, of course, for this talk of knowledge seems to imply everything previous took place under conditions of ignorance. This is not the point; the term knowledge is simply a label for the change from the 19<sup>th</sup> century socio-economy dominated by materials, commodities, physical work and tangible products to that of our time, with its predominantly mental and symbolic work, and slippery sense of things valued like Facebook or medical tests. Older economies and societies depended on knowledge and skills too, so the deeper point is to see how the balance of tangibles and intangibles has changed and, with that, the qualitative nature of the human condition.

When such change occurs new socioeconomic theories are needed - KBD is one, a reflection of our new context. The facts are that for the first time in our history more than half

the world's rapidly expanding population lives, produces and consumes in urban areas. Farming, mining, fishing, lumbering and hunting, which still engaged the bulk of the world's population in the 19<sup>th</sup> century, now employ less than 10%, while professional or 'knowledge work' has risen from a whisker to around 40%. Such massive changes imply huge changes in how we engage the world physically - and these changes seem likely to continue, obliging us to pay increasing attention to the relationships between the socio-economy and human geography, and to how we relate to Nature as we occupy the increasingly pressured environment.

Ever since Marshall's thoughtful consideration of 'industrial regions' - where the crucial commercial knowledge was 'in the air' - English-speaking economists have been interested in the spatial analysis of economic activity (Marshall, 1964). This interest was significantly accelerated by the work considered in our volume's chapters - authors such as Castells, Saxenian, Porter, Fligstein, Florida and others - while the focus has shifted from the Sheffield cutlers to Silicon Valley's chipmakers. KBD's impetus is that analyzing human geography's place in economic activity is more than an academic exercise; huge investment, business, tax and social policy decisions turn on it. As we look at the Rust Belt or the Niger Delta or New Orleans it is obvious we have yet to understand sufficiently. The subtlety of the interplay of dimensions Florida has dubbed TAPE (Technology, Arts & Culture, Professionals, Education) has clearly added new richness to our understanding of how the socio-economy, perhaps modeled as a diamond or Triple Helix, might work - but we are still more or less in the dark. KBD embraces all of the above, and adds further with its attention to micro level, the 'built environment' and its interest in what Bourdieu has dubbed '*habitus*', the convergence of the specific actors' past with the specific interactions and structures of the present.

### **This Afterword**

Three lines of thought and analysis converge here. First, KBD is positioned as a tool for planners and policy-makers, so it is useful to look to planning's history for some cautions. Attempts to engineer human society and geography go back to time immemorial - to Ragusa, Alexandria and beyond. Many of our book's chapters display a certain historical innocence as

they argue governments should take note of interactions that are typical of city life and invest in TAPE-type resources to produce economic innovation and growth - a variation on the 'build it and they will come' approach. This narrative raises unanswered questions about the many hundreds of urban and regional initiatives around the world that, aping Route 128 or Emilia Romagna, have been implemented with little success. Rather than theorize further we might learn more by studying these failures. One response, of course, is that these failing initiatives were policy-deficient and incorrectly architected, too narrow, neglecting one or more of the complex dimensions implied above. Another is that 'social engineering' is an inherently chancy business and that our theorizing is overly prone to lead us into thinking we have grasped the whole of a causal relationship which is, in reality, much more complex - though this throws the planning project itself into doubt. A third view, raised by Jane Jacob's notions of desirable 'urban chaos', is that all central policy is ultimately bound to fail, a view that reflects von Mises's and Hayek's similar attacks on central planning. This kind of reasoning raises parallel questions about the interplay of control and freedom in the realms of the arts and sciences. While patronage seems to have been crucial to many of the exciting periods in the history of art, there have been as many periods in which resource-poor 'outsiders' such as the Impressionists have produced the real paradigm shifts. Big Science has also been no simple route to progress.

The second line of thought is that cities are physical manifestations of the way societies operate and they arise unplanned. We can try to explain them functionally, but can seldom get to the bottom of why they arise in this place rather than that, or why they disappear, suddenly abandoned. Rather than being the outcome of specific plans, such when Caliph Ja'far Al-Mansur founded Baghdad in 762, or the founding of Canberra in 1913, cities like Glasgow emerged from their previous religious and academic identities as local commerce and the Atlantic slave trade grew, necessitating a complex entrepôt and service location. In short, to understand cities we must understand the society of which they are part - and this locates the planners and policy-makers inside them, pulled this way and that, rather than outside, objectively analyzing and pulling levers, insulated by their science from the political and economic systems that already exist. The Romans, for instance, and later the Catalans, developed a sophisticated trading economy throughout the Mediterranean region that extended into North Africa and what we call the Middle East. Their markets were under the control of all kinds of forces, political, religious and military. They had letters of credit, bankers, factories, contracts, lawyers,

inventories, production instructions and so forth, administrative instruments just like those we use today. The mix of politics and commerce was intimately articulated in the activities that took place only in cities - Rome and Barcelona, and elsewhere around the Mediterranean. Likewise Genoa's *Banco di San Giorgio*, founded in 1407, that maintained scrupulous records as it helped usher in a history-changing expansion of the credit system, illustrates how the Italian cities of the time set the stage for today's global capitalist economics. Shakespeare's *Merchant of Venice* reveals much about how this worked - and how the city was central to the processes. Likewise in the pre-colonial days of trade in the Indian Ocean - wonderfully illustrated by Chaudhuri's painstaking research (Chaudhuri, 1985) - we see the interplay of power and commerce and see how cities are the nexus of their interaction. No society is without some form of rule and whatever this is, be it a dictatorship, a theocracy or a democracy, it is hungry for the resources that commerce and industry alone produce. Chaudhuri shows us how over and over again across a millennia the merchants' need for security and predictability forced them to come to terms with the taxes, fees and levies the rulers needed equally urgently. Our geography is penetrated by human and social considerations. Delicate and dynamic bilateral arrangements came into place, open to being disturbed by any manner of upset, human or Natural. Today's economic crisis is simply the most recent such disturbance, more obviously global than many before, but inherently city based and shaped even as its effects reach into rural hinterlands in Bangladesh, Brazil or the Bahamas.

Even without being able to predict our socio-economic situation we see the pre-modern era of farming, fishing and so forth, was as dependent on cities for trading, storage, financing, transshipment and so on as is the modern economy. Cities existed long before the Industrial Revolution. Likewise Hoselitz's analysis of the classic notions of city function shows that the political economy of ruling and administering must be distinguished from the political economy of commerce and industry - the former giving rise to 'central' cities, the latter to 'industrial' cities (Hoselitz, 1955). We see this today in the separation of, say, Canberra and Sydney, Brasilia and Sao Paulo, Albany and New York. In general we see how the spatial arrangements we create reflect the social and political arrangements and institutions we create - and vice versa, reminding us of the iterations of Giddens's 'structuration theory' (Cassell, 1993). Likewise, while IT and modern communications change much, they do not 'change everything', just as the 'death of distance' turns out to be incorrect (Cairncross, 1997). Our spatial arrangements are

neither technologically nor geographically determined. The underlying point being that absent a good understanding of how any particular society works - its ethical, cultural and religious aspects as well as its economic, political and military aspects - we are unlikely to get to the heart of how we inhabit our space and time and why our cities exist.

### **How Knowledge Underpins KBD**

This afterword's third line of thought is KBD's focus on knowledge and in this respect it is path-breaking, leveraging from the knowledge-intensity of modern life to a better understanding of its other dimensions. In addition to understanding cities in terms of their physical structure or economics, places to 'break-bulk', get transportation permits, find buyers or otherwise reduce transactions costs, they are also places to generate new political, social, and technological knowledge that has economic consequences. But knowledge is a complex topic that has occupied philosophers, scientists and educators for centuries - and it is easy to drown in academic debate without getting to any of the key points that might illuminate the KBD project. It is not simply about communication and cities as hubs in a new technologically-facilitated communication network. Indeed given today's technologies, many expected distance and time, and thus human geography itself, to become irrelevant. The opposite seems to be the case. So the challenge is to not merely to find out how the socio-economy works, rather to explore knowledge's specific place in a theory of a knowledge-intensive society - and before we can consider how cities fit in we need some clarification of knowledge itself.

One route into 'knowledge' that avoids the perils of straight philosophy runs via the field of 'knowledge management' (KM). This subject is already familiar to many of our authors and readers. But it is important to be honest about what has been happening here. KM is not strong philosophically (Spender & Scherer, 2007). Nor are its practical implications clear. There is no denying it is tarnished, far from the shiny new coin it seemed three decades ago when Peter Drucker began to bring it - and the underlying social transformation central to KBD - to managers' and policy-makers' attention (Drucker, 1976). Today many wonder what happened to its promise and it is sometimes difficult to recall what all the fuss was about. But KM is no fad; there is substantial achievement beneath the confusion and chatter. 'Knowledge', as KM

defines it, is a potentially important route to understanding the modern socio-economy and, thereby, its spatial arrangements. But KM carries a lot of baggage too. On the one hand the information technology (IT) industry capitalized brilliantly and profitably on the new language - knowledge tools, knowledge engineers, knowledge systems, CKOs, KM journals and so on. On the other we see practicing managers using the language of 'tacit' knowledge and 'knowledge sharing' to draw more of their organizations' under-utilized skills and capabilities into play.

To understand knowledge-driven cities and knowledge-driven socio-economies we need to understand something of knowledge's more puzzling aspects. The point about the modern age is not that knowledge has newly become power; rather it is about changes in the processes of generating what we now consider to be wealth. Again, it is not production engineering (recall the Dutch windmills), or consulting (recall Machiavelli) or market research (recall the Silk Road) that is new. Over the last 40 or so years there has been a spectacular rise in productivity worldwide, in manufacturing and agriculture, far outstripping the additional demand from the world's rising population with its lengthening life-span. The result has been an equally staggering rise in standard of living for an increasing proportion of humans - though not all, of course (McCloskey, 2006). The number of hours we in the fortunate group have to work to meet our basic needs has declined to the point where luxuries and discretionary income drive our economies (though also increasing their volatility, as we are presently being reminded).

The structure of the developed economies has changed accordingly, the white-collar component vastly larger, what we have come to regard as 'knowledge workers' (Reich, 1992). Production has always demanded knowledge about how to do the work and, equally important, how to coordinate the extending division of labor that is driving the productivity gains. Coordination between firms, suppliers, and customers through markets and alliances is just as important. The underlying phenomenon is that for every unit of blue-collar work, of direct interaction with materials, be they steel, coffee beans, iPods or the dental patient's teeth, there is a huge and increasing number of units of white-collar 'knowledge work' - designing, planning, measuring, administering, allocating, contracting, directing, etc. Such structural elaboration is what draws new higher productivity equipment and techniques into economic relationship with the processes of consumption. Again, it is not that white-collar work's novelty is different, for clerks, inventory recording, planning and intelligence-collection have always been with us, as the

history above notes. The key is the amazing escalation in the relationship between the differentiation, increase and elaboration of knowledge work as it converges on the increased data volume, speed, and availability supporting the new global economy. Finally, the changes in our way of life have led to our developing and consuming services were restricted to the ruling classes alone, which we previously provided ourselves or never knew we needed - restaurants instead of home cooking, TV reality shows, online gaming, insurance instead of impoverishment, medical care instead of suffering, education instead of ignorance, and so on, all of which stand on ever more efficient information handling.

All this seems pretty straightforward, the implication being that managers need to understand how to use IT - ever more powerful for each unit of cost - to squeeze more value from more information, all standing on rising productivity and expanding consumption. This seemed obvious in the 1990s, for example in the rapid rise of out-sourcing as the world's economy began to restructure and redistribute the globe's work around a new geographical or regional division of labor - itself contingent on new IT, the Internet, new logistics technologies such as bulk shipping and containerization, and new financing, technology transfer and supply chain management techniques. As a result we began to talk of the world being 'flat', the immediate result of information-intensive management making it possible to move capital, both financial and intellectual, production, and distribution around with rapidity and efficiency as the global infrastructure improved.

What then of 'knowledge cities' as punctuations in this flat distance-less world? Why do cities still exist? Are they no more than vestigial remains of a pre-21<sup>st</sup> century socio-economy? It has taken the KM community some time, as we absorbed these exciting new capabilities, to discover their limitations, that time and space are still central to the human condition (Spender, 1998). In the process the knowledge management movement morphed and reinvented itself through several phases as it learned that it was not, after all, purveying the magic dust that could address every business problem. Writers such as Larry Prusak, who lived through KM's recent history, point to three phases; first, the immediate feeling of power, of achieving mastery of a new universe of possibilities. Finally we had a way to step behind work's outcomes to assess and control its most crucial input, not capital, land or labor, but knowledge (Prusak, 2001). The possession of resources was not that mattered - be they cash, patents, land,

agreements or employees - rather it was the knowledge of how to use them that made for competitive advantage and responsiveness to economic and technological change (Penrose, 1995). We never tired of telling how PARC Xerox invented while Apple profited or Fairchild invented while Intel profited or how Toyota was able to produce autos in America that overpowered the Big Three in the US markets. One result was the dot.com bubble and the accompanying story was that someone working in the business probably knew already what 'the next big thing' was going to be. So management was challenged to set up information collection systems that would mean that none of the corporate knowledge was overlooked, none of its experience in the R&D labs, production or the marketplace would get lost. For KBD the implication is that the city is a place for sharing knowledge of how resources might be best used.

KM's second phase was a corollary of the first. Realizing the firm's strategic knowledge was distributed rather than solely in the hands of the senior executives, we discovered that paying attention to knowledge raised a whole series of problems about the redistribution of organizational power. Subordinates seemed reluctant to share their knowledge, retirees were not happy to be subjected to knowledge engineers and their expert systems. We discovered that people hung onto their knowledge in different and often devious ways. So KM's second phase was about designing learning, education, and incentive systems designed to 'flatten' the organization, to make it look as if the firm was comprised of people whose interests were fully aligned and that the organization's power differentials did not matter. Many with their heads buried deep in the technology ignored these sociological and psychological issues and blithely worked on 'user-friendly' systems and slick GUI interfaces, attempting to minimize the difficulties confronting those who were prepared to 'share'. Many organizations and KM people are still stuck in this phase, working with intranets, zippy websites and blog-like interactions. For KBD the implication is that a city is a place representing the alignment of actors' interests that lead to knowledge sharing.

The third phase, where some organizations are today, is a sharper change, for it runs against the KM-industry's desires - among other things it reduces their profit margins. Organizations enter this phase as they reclaim their systems from the KM consultants and vendors whose long-term interests are in keeping them in a state of strategic dependency. Organizations learn to 'roll their own' knowledge systems in spite of the trumpeted benefits of

outsourcing and facilities management. Senior management eventually learns to question the limits of what IT-based approaches to KM can achieve - and the rest of us learn to reconsider how we think about knowledge and its limits. For KBD the implication is that knowledge can be managed, no matter how ethereal or slippery it seems - and cities, with their defining facilities, seem to be a way in which, through the development of complex social institutions, this actually happens.

Clearly we may be about to get beyond the low hanging KM fruit always visible to those in IT and engage the promise Drucker sensed. In the process we may also get a better understanding of why cities exist and how they work, and of why distance is alive and well and the world is far from flat. One of the events that helped put KM onto executives' radar was the publication of Nonaka & Takeuchi's *The Knowledge-Creating Company* in 1995 (Nonaka & Takeuchi, 1995). On the rare occasions when an academic book influences practicing managers it is often because it provides them with a language and way of thinking about things they are already doing or struggling with. This was the case a century ago when Frederick Taylor and his engineering colleagues began to talk about Scientific Management. Today most managers' notions of measurement and control reflect Taylor's thinking and language. An experienced machinist and foreman himself, Taylor argued the bulk of new production ideas came from the shop floor; so his 'system' began with collecting and analyzing these (Spender & Kijne, 1996). In KM's case Nonaka & Takeuchi's language of explicit versus tacit knowledge, top-down versus bottom-up, and the SECI knowledge-creation cycle, helped managers struggling with dynamic competition to reconnect with innovative capabilities distributed across their organizations. This was not something new, far from it. For decades managers had encouraged suggestion schemes, quality circles and other forms of bottom-up as they also engaged in top-down moves such as 6 Sigma, Baldrige Awards, ISO 9001, business process re-engineering, and so on. The KM approach brought all of this into a new framework - focusing especially on the tacit-explicit interplay that could only take place in the workplace. Here the KM vision was finally pushing beyond the mere collection, collation, storage and distribution of data - valuable as that might be - into a territory that lay outside IT's concerns and probably beyond IT's limits. Thus far KM has paid little attention to limits and we have no widely accepted language for handling knowledge and its impact on economic activity - hence many of the neologisms we see in our book's chapters. Yet knowledge-limits and knowledge-absences are creeping into economic and

social theorizing - bounded rationality, transactions costs, principal-agent theory, asymmetric knowledge, and so on. We open up the possibility of thinking about cities as knowledge-limit phenomena as much as they seem to be transaction cost, knowledge-transfer and knowledge-growth phenomena.

### **The Limits to Knowledge**

We do not understand a concept if we have no sense of its limits, of its reach. But knowledge is a term without obvious limits. We might contrast it with opinion, but that would only work if we could have 'objective' knowledge, a notion which Descartes and then Kant knocked flat. All knowledge is human rather than objective, determined by 'the real'; opinion is merely a way of disparaging what others claim to know. We might also contrast knowledge with emotion, which only makes sense if we can have knowledge without emotion. This illustrates some of the difficulties of stepping outside knowledge as a way of observing, measuring or analyzing it. Of course we cannot, knowledge refers primarily to our state of consciousness and to understand this better we might contrast the different ways in which we know. This is how the explicit / tacit distinction gathers its considerable power. Another important distinction is between 'data' and 'meaning'. Data is always hostage to the framework in which it is collected, sometimes in terms what can or cannot be measured, but more fundamentally in terms of the meaning attached to the data. Are the clothes sizes US or European, what is the currency, and so on? IT professionals meet this in the design of the system's underlying data structures - the definition of what counts and what does not. Putting this architecture in place makes some computations possible but excludes others for the whole point is to collect data that is relevant, avoiding that which is irrelevant. But data's meaning is outside rather than within the data. Computers do data not meaning. Meaning is about people, and data and meaning are intertwined. Rumsfeld, who had a talent for a felicitous phrase, famously defined meaning problems as 'connecting the dots'. Meaning is always outside the IT system, which is why some speak of IT as mere 'plumbing'.

To the surprise of most IT professionals, KM's vision takes us beyond managing data to the management of meaning. This is much trickier because meaning is subjective; what we

humans add to data (Spender, 2007). It is how 'optical illusions' happen - along with 'irrational exuberances' such as tulip-mania, Ponzi schemes and real estate bubbles. Every organization is a system of managed meanings, sometimes suggested in 'mission statements' but more generally floating about in the noisy discussions and interactions that fill the organizational space. Management is about keeping a handle on these meanings, owning them, shaping them, using them to direct the work of others. Many managers are tempted to clamp down on the meanings that develop organically in their organizations - the old battle between the 'formal' and the 'informal' - but doing so also shuts down creative dissent, the contrary or strange view that provides new insight into a problem situation, whether that be on the shop floor or in the Boardroom. We spend so much time in meetings because we are trying to balance being open and flexible against ensuring sufficient control meanings to move towards a shared goal. Yes, decisions get made and performance is reported, but the sub-text is to chew over whether this way of thinking about the situation is productive or not (generally not, we groan, change is slow and too often resisted). Thus KM is not just about data management, it is also about meaning-management - story-telling, reputation management (as when J&J pulled Tylenol), admitting or denying mistakes (the tobacco companies' executives), and so on. One cutting edge for KM, then, is a better understanding of meaning-management, how to theorize or model it and how to practice it. From KBD's point of view cities are places of the stories like Xanadu or Venice that evolve and change men's minds and behaviors.

Managing meaning is not simply about communicating it as if a meaning was another item of data. That is not the way humans work. We tend to have our own views, values, intentions and therefore our own system of meanings. Incompatible meanings are why negotiation is so difficult and exhausting. Meanings change and re-emerge slowly, most effectively and quickly through direct face-to-face interaction. That is why we put parliamentary debate at the center of our democratic system. Meetings can work this way. Direct conversation has breadth and depth computer-mediated communication does not. We have all experienced the difference between email interaction with those who share our views and with whom we can exchange facts (as we think of some data), versus those who do not share the same perceptions, who may be shocked or insulted by our emails. 'No, no' we say, that is not what we meant. Cities then are extensions of the ancient Greek and Roman forums, where politics was done, and the marketplaces of the Dutch Republic, where tulips, textiles and mace were traded. Their

emphasis is on the evolving patterns of meaning that determine how goods are valued and therefore how the economy itself functions.

### **Knowledge processes and human geography**

The difference between the essential geographically-constrained humanness of meaning-management and the abstract space-less technology of data-management gives us insight into how and why cities work and why geography matters after all - because cities are not passive infrastructures, they are vibrant contexts of human interaction. While data can flow freely - especially when we have appropriate IT systems - meaning is 'sticky', experiencing tremendous frictions. Meanings emerge from the social collective, but they also reflect individual leaders whose ideas are leveraged through the collective. These processes are not simple, because we all know there are times when stories (rumors) fly like wildfire, almost outpacing electronic media. At the micro level, research into the physical layout of R&D labs shows how valuable it can be to create of some neutral shared 'water-cooler' space. This facilitates the flow of ideas too sketchy or radical to be written down in reports - showing we often work in the conceptual spaces 'out of the box' - where the established languages are simply not useful.

A different example is the population distribution in the Great Plains territory (Chorley & Haggett, 1967). While the settlers' homesteads were located according to government edict, the territory changed as 'service centers' grew up - villages, towns and cities. The villages would be separated by half a day's wagon ride - there and back without having to stay over. One would find a church, a school, a barber, a farrier, a grocer, a bar and a rooming house. Towns had a sheriff and a jail, a doctor, a hotel and a theater perhaps, serving multiple villages. Other more complex services were located so they had bigger catchment areas. Where government services were based became a city, being supported by a complex multi-layered infrastructure of lawyers, courthouses, hotels, entertainment facilities, hospitals and so on. Each service has its own pattern of meanings, increasingly specialized and professionalized. Every organization is such pattern and must be constantly reacting to environmental changes - financial, competitive, legal, customer-driven and so on - if it is to remain in viable engagement with its stakeholders and markets. Note this patterning comes about as the synthesis of human desires - to

congregate, exchange goods and services, seek justice, enjoy a play, etc. - with the abstract technical possibilities of bringing people together. When the Model T replaces the horse-drawn wagon, the geography changes even though the human desires do not. Thus it is the difficulty of managing meaning that makes the organization's geography important - the need to be visible in Head Office to get promoted, the chance to disappear into the hinterlands and regroup after a defeat. Thus cities (and villages and regional clusters) exist for many reasons, but important among them are reasons to do with trafficking in meaning - just as 19<sup>th</sup> century artists clustered in Paris and post WWII in New York to be in touch with the latest developments, just as scriptwriters must be in LA. KM as meaning-management is a challenge to the organization's leaders to see and control the organization as a viable city, facilitating the interactions that matter and suppressing those that do not in an over-informationed environment.

But this is not the limit of KM's vision. Seeing the gap between data-management and meaning-management goes back to ancient times and does not distinguish KM from the ancient craft of speech-writing, critical reading, composition, or generally knowing how to harness language to the organization's goals. Messages matter whether they are for employees, shareholders or customers. But the distinction between data and meaning is always worth re-visiting for it reminds us of the differences between facts and values, and the differences between a computer's logical language and the 'natural' and the not-very-grammatical language we humans actually use in our interactions. If every fourth word is 'like', what is really going on? This points to the differences between our ways of knowing and a computer's way of 'knowing' - quite different, as is the implicit notion of 'knowledge', what is known. Humans know meaning as well as data and can appreciate the Epistles as fine examples of meaning management at a distance, revealing both the power of natural language as a way of stepping beyond data into meaning, and its weakness when contrasted with face-to-face conversation (which is why we keep flying to meetings).

KM's most signal contribution was to give a voice to those who knew already that organizations involve more than managing data and meaning (which, melded together, we call information). Organizations are systems of value-adding practice that stand on both information and practical skills - sometimes labeled 'tacit knowledge' (Spender, 1995). The main point of the Nonaka & Takeuchi story is the interplay of information and practice, bridging

intention and experience with tacit knowing. KM's full vision lets us separate knowledge-as-data, knowledge-as-meaning and knowledge-as-practice into three universes of understanding and managerial challenges (Spender, 2007). The failure to distinguish between these is one of the principal reasons for the high failure rate of KM projects - and, in a sense, KBD's aspiration is to treat cities (and maybe societies too) as KM projects. If one is engaged in a meaning-management project, putting the IT folks in charge is sure to lead to failure. Cities are not simply 'wired' places. If it the project is about practice, merely providing data will not hack it.

Of the three modes knowledge-as-practice is the most difficult. On the one hand we see the limits of knowledge engineering and expert systems as we seek to capture and model practice, on the other the complexities of 'transferring best practice'. The practice dimension of knowledge management is even less developed than the second meaning-management dimension but, ironically, it is where the greatest gains lie. Securing these clearly demands clarity in understanding how one is not dealing with either data or meaning. At the same time we realize how co-location, contiguity and so on get to matter. If ideas are to be reduced to a new skilled practice the water cooler approach is not enough, we must step inside the lab, as Jobs and Wozniak did, or as Deming did when helping the Japanese. Generally we know we must transfer skilled individuals or teams as viable carriers of best practice, rather than trying to codify the practice, even with lots of graphics and an interactive package. Thus cities are places in which people observe and engage with each others' practice in low cost ways - have meetings, visiting workshops and studios, hearing lectures, and so on. Fashion changes first on the city's streets and in its clubs as imaginative fashionistas strut their stuff. Famously, cubism evolved in a matter of months as Picasso and Braque were in and out of each other's studios daily. Turning this understanding around we see the different forms of knowledge move in very different ways and with different eases. Cities, in this reckoning, are knowledge-efficient systems for parsing the different kinds of knowledge and knowledge-interactions.

## **Conclusion**

So what must KBD learn from history, human geography and KM? All disciplines understand their methods and objectives better when they have a grasp of its history and of

why it is practiced in the way that it is. In this sense every discipline is more a social institution than an objective scientific endeavor. KBD is part of an attempt to move urban planning as an institutionalized endeavor into the Knowledge Age, proposing that cities and societies should be re-conceptualized around notions of knowledge. Unfortunately this takes us beyond the limits of current theorizing, for we have no knowledge-based theory of either cities or societies. But this should not deter us. Knowledge-based approaches are increasingly important in information technology as well as in economics, sociology and political science. KM's various phases open us up to its truly revolutionary nature as we moved from thinking of knowledge in a naive way - as data to be bundled up and whirled about with computers. This matters, of course, especially to those in the KM industry who are profiting mightily as a result. But it is only the tip of the KM iceberg. Far greater value lies below in the obscurities of managing meaning and practice, and the interactions between all three modes of knowing.

Thinking about 'knowledge cities' reminds us of the gulf separating computer science's logical abstractions and the limitless virtual worlds we can build there - such as SimCity - and how computers are constrained by the way in which they know. Thus Second Life cannot capture the moral complexity and multi-dimensionality of the human condition while the theater with its live actors and live audience can reach towards it. We fight wars over values and practices, not data. Competitive advantage is about connecting new dots and reducing them to novel practice. But as we make progress towards KM's objectives we learn something new about how fragile our cyber-penetrated way of life has become - for our human ways of knowing are increasingly hostage to our IT systems. An effective 'denial of service' attack can bring a hospital, a city, or perhaps even a nation, to a standstill. At the micro-level, this afterword can disappear without trace as my hard drive crashes, just our airplanes will be lost without ATCs and GPSs, and our banks collapsed by a virus. Increasingly we cannot spell or even think without Google to hand. Likewise knowledge cities and societies discover the enormous gains in productivity mentioned at the start of this essay can be reduced to chaos. Right now we are rediscovering the risks of over-leveraged credit; we have yet to discover the even greater risks behind KM's achievements. A KBD analysis is increasingly timely for it can reveal the fragile balance between the gains from our knowledge-driven socio-economy and the risks.

## Bibliography

- Cairncross, F. (1997). *The Death of Distance: How the Communications Revolution Will Change Our Lives*. London: Orion Publishing.
- Cassell, P. (Ed.). (1993). *The Giddens Reader*. Stanford CA: Stanford University Press.
- Chaudhuri, K. N. (1985). *Trade and Civilisation in the Indian Ocean: An Economic History from the Rise of Islam to 1750*. Cambridge: Cambridge University Press.
- Chorley, R. J., & Haggett, P. (1967). *Integrated Models in Geography*. London: Methuen.
- Drucker, P. F. (1976). The Coming Rediscovery of Scientific Management: Frederick Winslow Taylor May Prove a More Useful Prophet for Our Times than We Yet Recognize. *Conference Board Record, June*, 23-27.
- Hoselitz, B. F. (1955). The City, The Factory, and Economic Growth. *American Economic Review*, 45(2), 166.
- Marshall, A. (1964). *Elements of the Economics of Industry*. London: Macmillan & Co. Ltd.
- McCloskey, D. N. (2006). *The Bourgeois Virtues: Ethics for an Age of Commerce*. Chicago IL: University of Chicago Press.
- Nonaka, I., & Takeuchi, H. (1995). *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*. New York: Oxford University Press.
- Penrose, E. T. (1995). *The Theory of the Growth of the Firm* (3rd ed.). New York: Oxford University Press.
- Prusak, L. (2001). Where did Knowledge Management come from? *IBM Systems Journal*, 40(4), 1002-1006.
- Reich, R. B. (1992). *The Work of Nations: Preparing Ourselves for 21st Century Capitalism*. New York: Vintage Books.
- Spender, J.-C. (1995). Organizations are Activity Systems, Not Merely Systems of Thought. *Advances in Strategic Management*, 12B, 153-174.
- Spender, J.-C. (1998). The Geographies of Strategic Competence: Borrowing from Social and Educational Psychology to Sketch an Activity Based Theory of the Firm. In A. D. Chandler, P. Hagstrom & O. Solvell (Eds.), *The Dynamic Firm: The Role of Technology, Strategy, Organization, and Regions* (pp. 417-439). New York: Oxford University Press.
- Spender, J.-C. (2007). Data, Meaning and Practice: How the Knowledge-Based View Can Clarify Technology's Relationship With Organizations. *International Journal of Technology Management*, 38(1/2), 178-196.
- Spender, J.-C., & Kijne, H. (Eds.). (1996). *Scientific Management: Frederick Winslow Taylor's Gift to the World*. Norwell MA: Kluwer.
- Spender, J.-C., & Scherer, A. G. (2007). The Philosophical Foundations of Knowledge Management: Editors' Introduction. *Organization*, 14(1), 5-28.