

**CONVERGENCE vs. DIVERGENCE: A COMPARATIVE
ANALYSIS OF SINGAPORE VERSUS SILICON VALLEY
KNOWLEDGE MANAGEMENT PRACTICES**

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INTRODUCTION

In comparative management literature and research, there is continuing debate between those who advocate “convergence” vs. those who advocate “divergence”. Early on, in a prescient statement, the convergent perspective was clearly stated by Richman and Farmer (1965):

“As the general similarity of men everywhere is recognized, and as managerial and technological necessity presses all types of culture toward a common road, nations everywhere become more similar; the logic of technology and management will lead all to the same general position...”

By sharp contrast to the view of Richman and Farmer, the strongest and most visible advocates of the divergent position are Hofstede (1991) and Laurent (1983). In his landmark work with IBM, Hofstede found sig-

nificant cultural differences among the 53 national subsidiaries represented in his study; those differences were reflected in four major dimensions: *Power Distance, Individualism vs. Collectivism, Masculinity vs. Femininity* and *Uncertainty Avoidance*.

Based on his research with INSEAD Executive Development students, Andre Laurent concluded:

“... Deep seated managerial assumptions are strongly shaped by national cultures and appear quite insensitive to the more transient culture of organizations... there is no such thing as Management with a capital M. The art of managing and organizing has no homeland...”

The premise of this study is that there is a growing global technoculture fostering innovation that is unbounded by traditional national and cultural boundaries. The pressures of competing in the new economy, especially for knowledge-intensive organizations, have created this technoculture of shared values and behavioral norms. To test this premise, we will be comparing knowledge-management practices in firms located in two culturally different national/regional locations - Singapore vs. the Silicon Valley. We, therefore hypothesize *convergence*:

- (1) That the current knowledge management practices of Singapore firms as a whole will not differ significantly from Silicon Valley firms.
- (2) That the importance assigned to these knowledge management practices will not significantly differ in the Singapore firms as compared to the Silicon Valley firms.
- (3) That no significant difference will be found between the Singapore firms and the Silicon Valley firms in several of Hofstede's cultural dimensions.

In addition, we hypothesize:

- (4) That there will be no significant differences in knowledge management practices when Malaysian-managed firms within Singapore are compared to Chinese-managed firms.

CONCEPTUAL BACKGROUND

There is one recurrent theme that dominates current management thinking: how to build sustainable competitive advantage in a boundaryless, volatile, innovation-driven marketplace. As technology propels us ever more rapidly and deeply into the Knowledge-Network Age, the need for identifying organizational practices and culture that characterize successful firms becomes urgent. Increasingly, establishing competitive leadership is becoming dependent on how well organizations manage their knowledge-based intangible assets. There is growing recognition that real competitive advantage lies in what the organization knows and how quickly it can access and apply that knowledge. People-embodied knowledge has become the only meaningful resource in a networked world, irrevocably replacing Industrial Age factors of production such as labor, capital and land (Drucker, 1998).

“When we talk about the new economy, we’re talking about a world in which people work with their brains instead of their hands. . . A world in which innovation is more important than mass production. A world in which investment buys new concepts or the means to create them, rather than new machines. A world in which rapid change is a constant. A world so different its emergence can only be described as a revolution (Browning and Reiss, 1998).”

Indeed, Amidon (1997) points out that the knowledge-intensive organization is more appropriately viewed from the perspective of a “strategic business network” (SBN) rather than the traditional “strategic business unit” (SBU).

What, then, are the major organizational distinctions between the Industrial Age and the Network Age:

	<i>INDUSTRIAL AGE</i>	<i>NETWORK AGE</i>
<i>EXTERNAL ENVIRONMENT</i>	<i>Static, predictable, linear</i>	<i>Fluid, global, unpredictable, complex</i>
<i>WORK PROCESSES</i>	<i>“Scientific Management”, focused on efficiency</i>	<i>Focused on effectiveness</i>
<i>ORGANIZATIONAL STRUCTURE</i>	<i>Hierarchical, functionally differentiated</i>	<i>Networked, organic, flexible</i>

Continued

	INDUSTRIAL AGE	NETWORK AGE
DECISION MAKING	<i>Top-down, command and control</i>	<i>By diverse, self-managing teams</i>
KNOWLEDGE	<i>Restricted to management and "experts", emphasis is on "explicit" knowledge</i>	<i>Universally shared, emphasis is on "tacit" knowledge</i>
KNOWLEDGE WORKERS	<i>Only managers are capable of generating knowledge and applying that knowledge.</i>	<i>Knowledge is broadly held - all organization members are capable of generating knowledge and applying that knowledge.</i>
ORGANIZATIONAL LEARNING	<i>Single-loop", underlying assumptions are rarely challenged, no tolerance for experimentation failed attempts at innovation are punished</i>	<i>"Double-loop", underlying assumptions are always challenged, experimentation is constantly encouraged; failure is essential to learning</i>

Although the Industrial Age certainly included major technical innovations, the pace of innovation has accelerated dramatically during the Network Age. This explosion of innovation has been especially spurred by a process of Organizational Learning that discards the hierarchical and political constraints characteristic of Industrial Age organizational cultures.

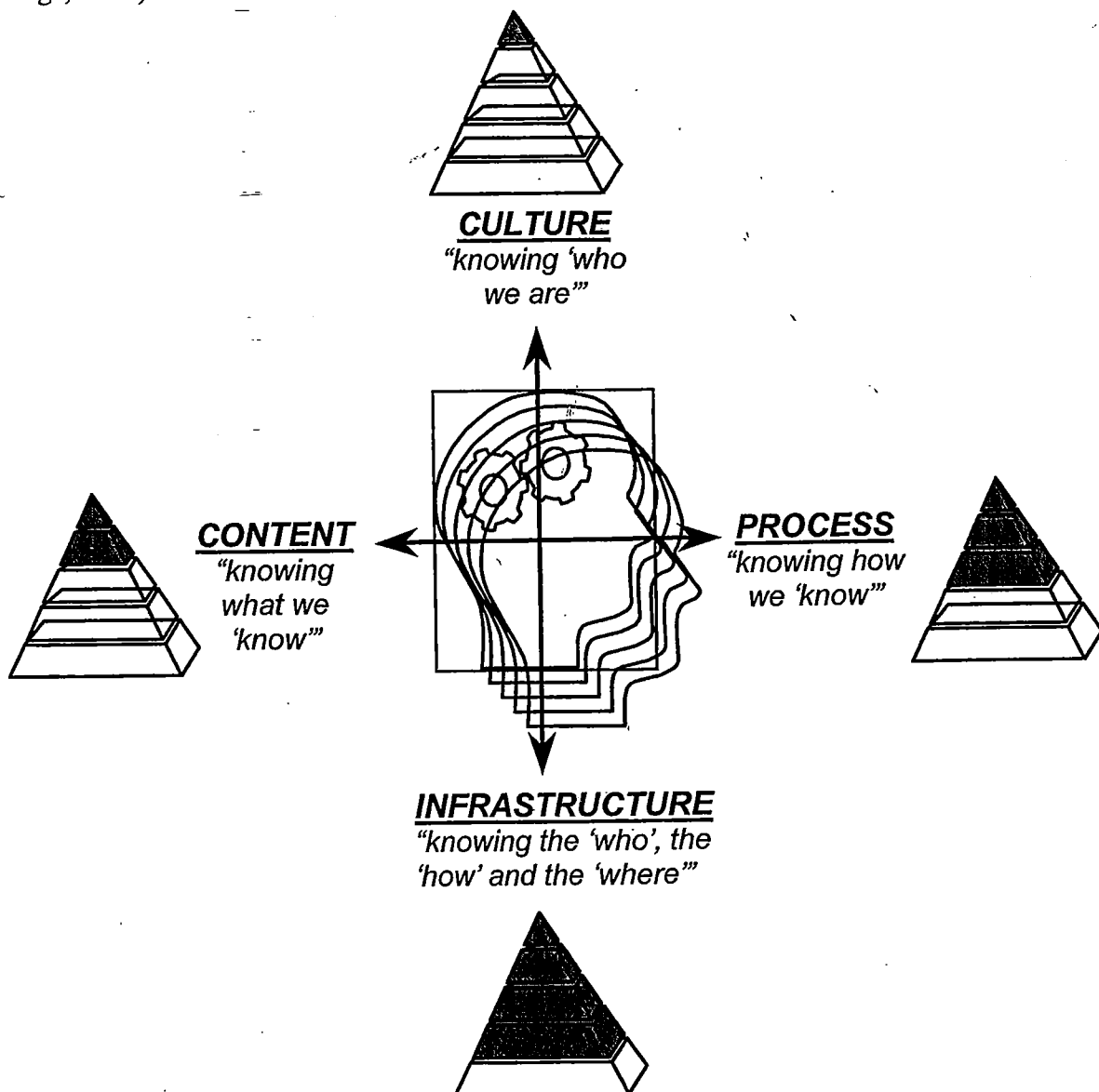
KNOWLEDGE IN THE NETWORK AGE ENTERPRISE

Knowledge, Pederson (1998) points out, can be described as the integration of ideas, experience, intuition, skill, and lessons learned that has the potential to create value for all stakeholders of a firm. Value is created through knowledge by providing a more informed basis for decision-making and action. Nonaka and Takeuchi (1995) take the notion of knowledge in the firm further and define two realms of knowledge: "tacit" and "explicit". Explicit knowledge is easily identifiable, easy to articulate, capture and share. It is most readily apparent, but forms only the tip of a knowledge iceberg. It resides in the heads of people and therefore consists predominantly of intuition, insight, perception and beliefs and to a great extent is experiential. Tacit knowledge is deeply imbedded in the culture

of the firm and is therefore elusive, difficult to capture and even more difficult to transfer. Of the two, tacit knowledge carries the greater value. It is a key determinant of competitiveness and forms the basis of exceptional performance.

Managing knowledge in the Knowledge-Network Age is a truly multidimensional challenge. It requires simultaneous management of four inextricably linked domains (see Figure 1): culture, content, process and infrastructure, all of which also have a tacit as well as an explicit dimension [Birchall and Tovstiga (1998); Chait (1998); Tovstiga and Korot (2000)].

Figure 1. Organizational Knowledge Domains [shaded regions indicate, approximately, proportion of knowledge residing in the explicit realm, open boxed regions the proportion of the organization's knowledge embedded in the tacit realm]. (Source: Korot and Tovstiga, 1999).



Knowledge Culture or "Knowing Who We Are" It is in this domain that the values, beliefs and behavioral norms are played out. It is the most elusive domain but is the prime determinant in the success of knowledge management. It is here where we find the cutting distinction between Industrial Age and Network Age enterprises. With reference to Schein's (1992) three levels, culture ranges from the highly explicit, visible organizational structures and procedures ("artefacts") to those highly tacit, largely out-of-awareness, deeply imprinted core beliefs that guide an individual's behavior.

Knowledge Content or "Knowing What We Know" This domain comprises the firm's stock of strategically relevant knowledge – both explicit and tacit. It exists in the firm in the form of:

- Experiential knowledge – highly tacit, derived from previous experience and often difficult to articulate.
- Formal knowledge – refined, documented, highly explicit in nature.
- Emerging knowledge – both tacit and explicit, emerging at the interface of highly innovative and cross-disciplinary interactions in the firm such as new product development projects.

Knowledge Infrastructure or "Knowing the 'How' and the 'Where'" This domain encompasses all functional elements in the firm that support and facilitate the management of knowledge. Information and communication technology is one such element. For many organizations, knowledge management stops here. But, knowledge infrastructure is much more – it includes the carriers of knowledge such as cross-functional, cross-national project teams. Fluid processes (Maira, 1998) and flexible teams ensure the rapid transfer of knowledge across complex and shifting internal and external organizational boundaries.

Knowledge Process or "Knowing How We Know" A firm's knowledge process domain incorporates how knowledge is created, converted, transferred, applied and ultimately discarded. Nonaka and Takeuchi have identified four key knowledge conversion processes – "socialization" (tacit to tacit), "internalization" (explicit to tacit), "externalization" (tacit to explicit) and "combination" (explicit to explicit). Knowledge processes can also involve roles played by knowledge workers in the firm (Tovstiga, 1999).

RELATED RESEARCH

Knowledge Management

One of the more comprehensive conceptual frameworks for knowledge creation and conversion is that of Nonaka and Takeuchi (1995). The authors describe how knowledge-intensive organizations, when innovating in response to a changing environment, create new knowledge. Knowledge creation occurs as a result of the spiral interaction between tacit and explicit modes at different points within the organization. The key is in the externalization process that mobilizes and converts tacit knowledge. When shared across the organization, this newly created knowledge contributes to increased learning in the organization. It is Nonaka and Takeuchi's theory which formed a major building block for the Knowledge Practices Survey used in this study.

Comparative Management

In the voluminous literature and research published in the field of comparative management, the most visible work is that done by Geert Hofstede. In his landmark cross-national study of IBM referred to earlier, Hofstede identified four dimensions that differentiated national cultures: "Individualism", "Power Distance", "Uncertainty Avoidance" and "Masculinity". Hofstede's framework continues to drive a number of comparative management studies and serves as the prime support for the divergent viewpoint – that is, that national culture differences override similarities in management thinking and processes.

Ulijn and Kumar (1999) reviewed the comparative management literature in pursuit of the question "How can cultures respect each other, learn from each other and cooperate effectively, for instance, in business and technology". In the broad spectrum of the communication, language and national culture studies summarized by Ulijn and Kumar, the underlying premise of those studies is consistently that of divergence although the authors make the point that convergence can be reached through effective communication in technology and business.

By contrast, Korot (1989, 1997) pursued the hypothesis that there is a high-technology culture that transcends national identity. The original research was based on a survey of 17 high-technology start-ups in Ireland, the UK and France. The survey instrument was based on Schein's (1992) definition of organizational culture and assessed respondents' perceptions of the effectiveness of their organization in dealing with the issues of ex-

ternal adaptation and internal integration. The study concluded that remarkable convergence rather than divergence was found among the corporate cultures of these diverse enterprises and that this convergence was due to a common “powerful combination of external and internal forces:

- A highly volatile, changing, largely unpredictable market environment that demands proactive, creative problem solving, impossible to achieve within the constraints of traditional organizations and
- A well educated, young, diverse workforce that views itself as ‘professional’ and will not tolerate traditional management that limits individuality, responsibility, and continuous opportunity for learning and growth.”

The addition of Silicon Valley technology start-ups to the study sample confirmed the findings of the earlier study leading to an organizational profile that characterizes “technocultures”.

Knowledge Worker Profiling

It is the knowledge worker who is critical to effective knowledge management. In his study of knowledge creation/conversion processes and the contributions of knowledge workers to each of the knowledge processes, Tovstiga (1999) concluded that the knowledge worker’s role is really a hybrid and flexible composite of competencies and attributes distributed across boundary dissolving “communities of knowledge practices”. It is these, often informal, loosely structured communities that are the essence of cross-national convergence of knowledge management practices.

METHODOLOGY: PROFILING KNOWLEDGE-BASED ORGANIZATIONS

Research Sample

The survey data for this study was collected from managers and technical professionals in 124 knowledge-intensive organizations: 30 Silicon Valley enterprises and 94 Singapore enterprises. Surveys were distributed to each of the 124 organizations by the researchers directly or by internal research assistants. The average return rate was 60 percent. The survey was trans-

lated and back-translated in the native languages of the countries represented in the study, although English was the version chosen by the majority of respondents. Increasingly so, English is becoming the universal language for managers and technical professionals in high-technology companies around the globe.

Survey Instrument

The Knowledge Management Practices (KPS) survey instrument was developed by Korot and Tovstiga (1999) drawing from their previous research. The instrument consists of 21 items, which tap into the four major domains of knowledge management described previously. Respondents are asked to give their perceptions of the current practices within their organization and how important they consider a specific practice to be. Knowledge Culture items include learning focus, experimentation, participation, openness and trust, and organizational structure. Knowledge Content items include: Where knowledge resides, sources of knowledge, knowledge dissemination and knowledge flow. Knowledge Process items include strategy process, learning process and gap management. Knowledge Infrastructure includes items such as access to key knowledge, sharing of knowledge, and degree of interpersonal networking.

For each of the 21 items, respondents are asked to assess on a scale from 1 to 5:

- The extent to which the item describes the organization's current knowledge management practice.
- The importance the organization places on the particular practice.

Hypotheses

The following hypotheses will be tested using the KPS results.

H1: Overall, the Silicon Valley sample will not differ significantly from the sample of Singapore firms in *current* knowledge management practices.

H2: Overall, the Silicon Valley sample will not differ significantly from the sample of Singapore firms in the *importance* assigned to knowledge management practices.

H3: Experimentation is equally encouraged, supported and facilitated in the Western (Silicon Valley) and Asian (Singapore) firms (Hofstede's "Uncertainty Avoidance").

H4: Knowledge is collectively shared, not retained by individuals in both the Western and Asian firms (Hofstede's "Collectivism vs. Individualism").

H5: Employees at every hierarchical level are involved in decision-making in both the Western and Asian firms (Hofstede's "Power Distance").

H6: Within the Singapore sample of firms, there will be no significant difference between those firms that are Malaysian managed vs. those that are Chinese managed.

Operational Definitions

H1: Comparisons of the mean "current practices" survey scores of the Singapore firms vs. the Silicon Valley firms on all 21 survey items:

H2: Comparisons of the mean "importance" survey scores of the Singapore firms vs. the Silicon Valley firms on all 21 survey items.

H3: Comparison of the mean current practice scores on item #7 - "Experimentation"

H4: Comparison of the mean current practice scores on item #2 - "Knowledge Sharing"

H5: Comparison of the mean scores on item #8 - "Participation"

H6: Comparison of the mean "current practices" survey scores of the Malaysian versus the Chinese respondents on all 21 survey items.

RESEARCH FINDINGS

Analysis of the results of previous studies conducted by the authors indicates that a gap of 0.5 points or more on the 5-point scale is statistically significant.

H1: The graph in Figure 2 shows remarkable congruence in perceived performance levels of *current practices* between the Silicon Valley firms and the Singapore firms, with only one practice (20) approaching significant difference - "Gap Management: well defined processes are implemented for systematically identifying and closing knowledge gaps". Thus, this hypothesis is confirmed.

H2: A very different picture emerges when the Singapore and Silicon Valley firms are contrasted on the *perceived importance* of the surveyed knowledge management practices (Figure 3). The Silicon Valley respondents attach significantly more importance than the Singapore respondents to: rewards and incentives for contributing to the development and sharing of knowledge (9); loose definition of organizational structure (10); a climate of openness and trust (11); the sharing of knowledge within the organization (14); interpersonal networking (15); and the transfer of knowledge across internal and external boundaries (16).

H3: The hypothesis is confirmed. Experimentation, which runs counter to "uncertainty avoidance", is seen as equally encouraged and supported by the Western and Asian respondents.

Figure 2. Comparison of Current Performance [●Singapore firms; ■Silicon Valley firms].

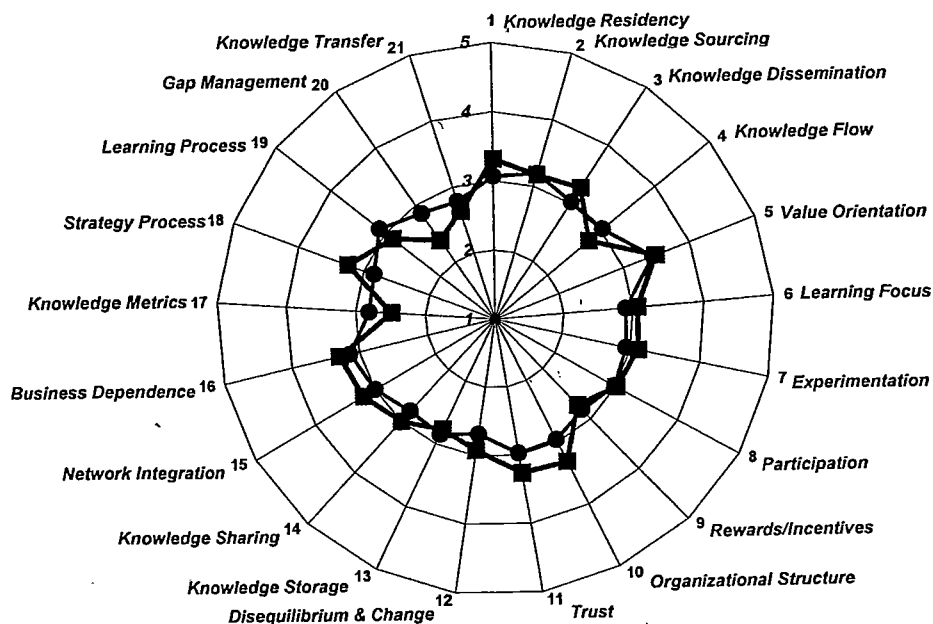
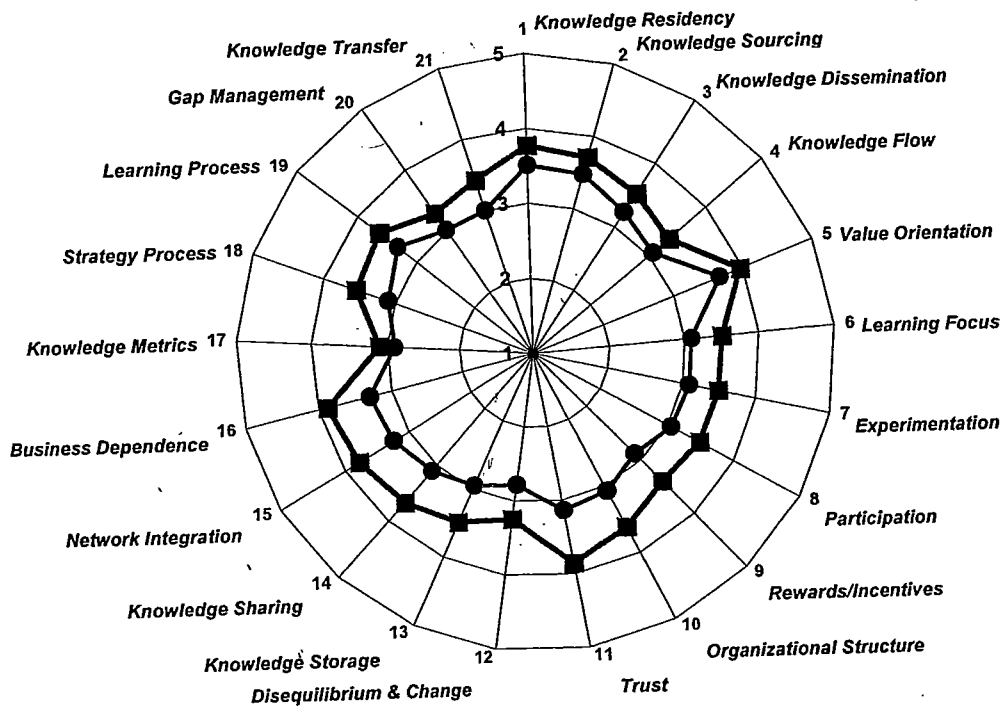


Figure 3. Comparison of Perceived Importance of Practice [●Singapore; ■Silicon Valley].



H4: The hypothesis is confirmed. Collective sharing of knowledge, rather than individual husbanding of knowledge, is equally supported by the Western and Asian respondents.

H5: The hypothesis is confirmed. Involvement of employees at every organizational level in decision-making is equally prevalent in the Western and Asian organizations.

H6: With the exception of item 2, *Knowledge Sourcing*, there is no significant difference between the Malays and Chinese respondents. Thus, the hypothesis is confirmed.

CONCLUSIONS AND DISCUSSION

In terms of current knowledge practices, the results of this study lend support to the convergence view – that is, the gap between Eastern and Western cultural values and norms, clearly observed in most comparative management studies, disappears in knowledge-intensive organizations. The technological subculture appears to override national and ethnic distinc-

tions. The Network Age represents a blending of cultural values and practices, much deeper than the superficial likenesses that we see in the global spreading of "pop" culture. Knowledge workers, regardless of their national origin, share a common view of the world rooted in the belief that technology will be the most powerful, universal influence in the 21st century.

But, the results of the comparison of perceived importance of the surveyed knowledge management practices are intriguing. The Western (Silicon Valley) respondents' expectations are consistently higher, apparently expressing a stronger need to see Knowledge-Network Age practices fulfilled than do their Asian (Singapore) counterparts. The Asian respondents appear more comfortable in a relatively closed, more structured organizational culture than do the Western respondents, suggesting that there is still some cultural distance to travel in terms of future convergence.

Although limited, the data from this study also lend themselves to speculation about Singapore ethnic/religious subcultural differences. Item 6, "Learning Focus" (the willingness to challenge existing beliefs and practices) shows some difference between Chinese Christians and Chinese Buddhists. Perhaps Chinese Christians in Singapore, who tend to be younger and more educated, are more aware of a need for new ways of conducting business than is recognized by older, more traditional Chinese Buddhists. The difference in perceptions between Chinese Christians and Chinese Buddhists (as well as Hindus and Muslims) may also reflect that management in Singapore companies is largely Chinese Christian and thus more in tune with the dynamics of a global economy and on the surface, at least, committed to trying to create more open, collaborative organizational cultures.

This area of ethnic/religious influence on knowledge management practices is still relatively unexplored and requires much additional research to test the speculations put forward in this paper.

In summary, the results of this study point toward convergence as an increasingly strong force driving knowledge management in the Network Age, global economy.

REFERENCES

- Amidon, D. M. (1997). *Innovation Strategy for the Knowledge Economy: The Ken Awakening*. Butterworth-Heinemann, Boston.
- Browning, J. and Reiss, S. (1988). Encyclopedia of the New Economy, *Wired*, March.

- Birchall, D. W. and Tovstiga, G. (1998). Methodology for Assessing the Strategic Impact of a Firm's Knowledge Portfolio, *8th International Forum on Technology Management*, Grenoble, France, 2 - 6 November 1998.
- Chait, L. (1998). Creating a Successful Knowledge Management System, *Prism*, Second Quarter Issue, pp. 83.
- Drucker, P. (1998). Presentation, *3rd International Competency Conference*, Royal Lancaster Hotel, London, 7 - 10 September (Linkage Inc.)
- Hofstede, G. (1991). *Cultures and Organizations*. McGraw-Hill, London.
- Imparato, N. and Harari, O. (1994). *Jumping the Curve: Innovation and Strategic Choice in an Age of Transition*. Jossey-Bass, San Francisco.
- Korot, L. (1989). Technoculture: Leading Edge to European Integration or an Organizational Anomaly? *Proceedings of the 1989 Annual Conference*, European International Business Association.
- Korot, L. (1997). A Cross-Cultural Comparison of the Organizational Cultures of Hi-Tech Start-Up Ventures, Presentation, Executive MBA Group, Pepperdine University.
- Korot, L. and Tovstiga, G. (1999). Profiling the Twenty-First-Century Knowledge Enterprise, in Wright, R. and Etamad, H. (Eds.). *Research in Global Strategic Management*, 7: 157-172, JAI Press.
- Laurent, A. (1983). A Cultural Diversity of Western Conceptions of Management, *International Studies of Management and Organization*, 3: 75.
- Maira, A. N. (1998). Connecting Across Boundaries: The Fluid-Network Organization, *Prism*, First Quarter Issue, pp. 23.
- Nonaka, I. and Takeuchi, H. (1995). *The Knowledge Creating Company*. Oxford University Press, New York
- Pederson, P. O. (1998). Contribution in *Knowledge Management Review*, Issue 1 (March/April).
- Richman, B. and Farmer, R. (1965). *Comparative Management and Economic Progress*. Jossey-Bass, Homewood, Ill.
- Schein, E. H. (1992). *Organizational Culture and Leadership*, 2nd Ed. Jossey-Bass, San Francisco.
- Tovstiga, G. (1999). Profiling the Knowledge Worker in the Knowledge-Intensive Organization: Emerging Roles, *Int. J. Technology Management*, 18(5/6/7/8): 731-744.
- Tovstiga, G. and Korot, L. (2000). Knowledge-Driven Organizational Change: A Framework, *Int. J. Entrepreneurship and Innovation Management*, Vol.1 (in press).
- Ulijn, J. and Kumar, R. (1999). Technical Communication in a Multicultural World: How to Make It an Asset in Managing International Businesses, Lessons for Europe and Asia for the 21st Century in Hager, P. J. and Scheiber, H. J. (Eds.). *Managing Global Communication in Science and Technology*, John Wiley & Sons, Inc., pp. 319-348.