Corporate Cultures in the Eras of Productivity, Quality, and Innovation:

A Perspective from Hong Kong

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Abstract

Progress in the manufacturing sector of any developed region, including Hong Kong, has generally proceeded in three successive but overlapping phases based on the dominant competitive strategy (productivity, quality, or innovation) adopted. Hong Kong has passed through the first two phases and is preparing itself to move into the third phase. The degree of success of Hong Kong in embracing innovation will depend upon the innovation strategy it chooses on the basis of the fit between its general corporate infrastructure and culture and the requirements of competition through technological innovation. This papers examines this issue on the basis of the well-known Hofstede indices: power distance, individualism, uncertainty avoidance, and masculinity. Incremental and disruptive innovation strategies are identified to be feasible for Hong Kong.

1. Introduction

Global experiences in the twentieth century point to three broad trends [1]. Firstly, almost every large and developed economy in the world has achieved material progress through three sequential but overlapping movements: consolidation and modernization of agriculture, growth of domestic manufacturing followed by its gradual integration into global manufacturing, and growth of the service sector. Economies such as Singapore, Hong Kong, and Japan, have progressed mainly through impressive performances in the manufacturing and service sectors. Secondly, there has been relentless and ever-increasing penetration of technology into every aspect of industry. Thirdly, owing to the emergence of affluent societies, the world market is becoming more and more customer-oriented.

The maturation of manufacturing sectors has generally followed three successive but overlapping phases of competitive emphasis (see Figure 1) [1]. The first phase is characterized by competition through productivity (P). In the second phase, the competitive strategy shifts to achieving higher quality (Q), i.e. achieving higher consumer satisfaction, while maintaining productivity. The competitive focus in the third phase is on gaining further market share through innovation, i.e., "new ways of delivering customer value [2]". Note that innovations may be incremental or radical and may or may not require large investments in research and development (R&D). The 'value' to be delivered is traditionally
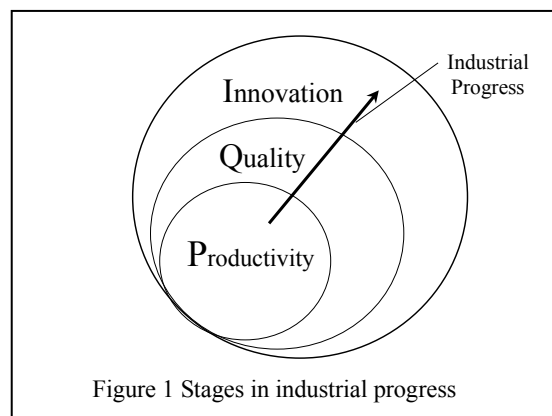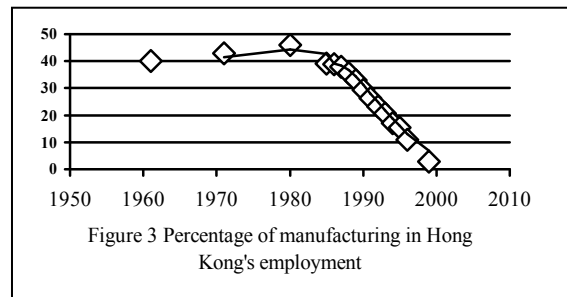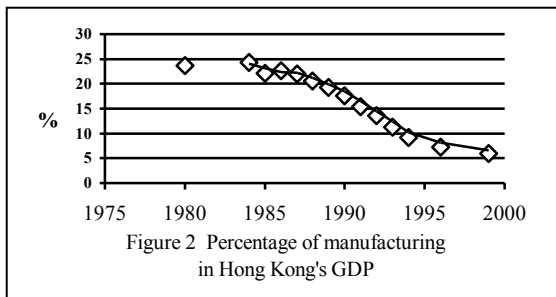
Figure 1 Stages in industrial progress

determined through consultations with customers. This presupposes that the customers are well informed and there exist strong corporate mechanisms that promote close links with customers. Since 'customer value' is a core concept of 'quality', prior passage of a corporation or society through the era of quality benefits its success in the era of innovation. Finally, the notion of innovation includes value delivery to customers. This means that a corporation pursuing innovation as its competitive strategy needs to be strong in terms of technology as well as business (organizational culture, marketing, etc.). The focus of the present paper is on issues related to corporate culture from the point of view of Hong Kong.

2. An Overview of the Growth of Manufacturing 'in' and 'by' Hong Kong

Irrespective of the measure used for economic ranking, over the last decade, Hong Kong has remained among the top ten countries of the world. Despite the fact that its economy was affected negatively during the 1997 Asian financial crisis, Hong Kong's gross domestic product (GDP) per capita moderated by purchasing power parity (ppp) has remained around US$23,600 [3]. This is next only to that of Japan in Asia. How did Hong Kong achieve this impressive economic growth?

Prior to its cessation-cum-lease to Britain in 1898, Hong Kong was a rural and underdeveloped region relying on small-scale agriculture, fishing, and trade. This picture had largely remained unchanged during the early part of the last century. The scenario began to change significantly when there was a large influx of immigrants from the Chinese mainland around the middle of that century. The entrepreneurship of these immigrants coupled with the *laissez faire* policy pursued by the Government of Hong Kong led to rapid economic growth. This growth took place in two main directions.

Figure 2 Percentage of manufacturing in Hong Kong's GDP

Figure 3 Percentage of manufacturing in Hong Kong's employment

Firstly, Hong Kong took full advantage of its geographic proximity to the mainland and its excellent natural harbor to progressively become a major world player in terms of tourism, shipping, trade, and international finance. This led to a strong service sector. Secondly, Hong Kong entrepreneurs developed a highly effective and horizontally integrated manufacturing economy. Manufacturing activity initially started with silk flowers and then progressed to include textiles, garments, plastic products and machinery for producing them, electronic products, watches, and electrical appliances. Thus, by 1980, the share of manufacturing in Hong Kong's GDP reached 24% (see Figure 2). Likewise, by about 1975, the share of manufacturing in employment reached about 48% (see Figure 3).

How did Hong Kong achieve this spectacular growth in manufacturing within a few decades notwithstanding a serious lack of the four basic factors of production—land, labor, raw materials, and capital—identified by classical economic theorists? (Hong Kong's habitable area is under 100 square miles, its population is a mere 7 million, it has no natural resources, and much of its present capital availability is a result of its economic growth rather than its cause.)

The growth in manufacturing prior to 1980 was led mainly by the aggressive pursuit of global competition through productivity (P) supported by the good transportation, power, and housing infrastructure developed by the Government; and horizontal integration of a large number of small and medium-scale enterprises. The competitive strategy during that period consisted of achieving significant reductions in production costs and times within the general context of original equipment manufacturing (OEM). By the early 1980s, productivity-related techniques such as Work Study and flow-line layouts were already very much in place and techniques such as Just-In-Time (JIT), *kanban*, and Materials Requirements Planning (MRP) were rapidly gaining ground.

The era of productivity continued into the 1980s and the early 1990s (see continued growth in value added per person as illustrated in Figure 4). However, this time, it was coupled with a perceptible shift in competitive strategy towards quality (Q). The ISO9000 movement gained ground and progressed to embrace Taguchi experimentation, zero defects, statistical process control, and Total Quality Management (TQM).

Figure 4 Growth in value-added per person in Hong Kong's manufacturing sector, US$
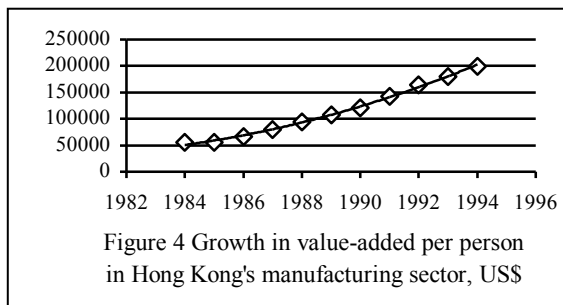
Thus, Hong Kong had entered the era of quality. However, growth in productivity continued through the adoption of computer-aided design (CAD), computer-aided manufacture (CAM), computer numerical control (CNC), and the general use of computers in carrying out most manufacturing activities. This period also saw some activity directed towards original design manufacturing (ODM).

Around 1982, agreement was reached between China and Britain to return the territory of Hong Kong to China in 1997. This fact, coupled with the 'four modernizations' movement within China, led to a flurry of activity by Hong Kong entrepreneurs to transfer domestic manufacturing operations over to nearby locations (mainly Guandong province) within the Chinese mainland with a view to taking advantage of the significantly lower labor and land costs there. By the end of the century, Hong Kong based enterprises were employing 4 to 5 million workers within the mainland. As a result, grand and new metropolises (e.g., Shenzen) emerged just beyond the northern borders of Hong Kong.

The movement of manufacturing beyond Hong Kong's borders however led to rapid dwindling of the shares of Hong Kong's manufacturing in Hong Kong's GDP as well as domestic employment (see Figures 2 and 3). However, the total monetary value of domestic production was maintained through improvements in productivity following investments in higher technology and further strengthening of design activities.

By the late 1990s, the "hollowing out" of domestic manufacture described above had become a topic of intense concern and debate. Policy makers within Hong Kong started realizing that migration of manufacturing away from Hong Kong might adversely affect the economic stability of Hong Kong. Some feared that exclusive reliance on the service sector (however prosperous) might make it vulnerable to flight of capital and economic stagnation in the event of a financial crisis. These fears actually materialized during the Asian financial crisis that had started in 1997. Hong Kong found itself amongst the regions hardest hit.

The negative developments described above led the Chief Executive of Hong Kong Special Administrative Region (HKSAR) to form a special Commission on Innovation and Technology. The commission presented its final report in mid-1999 and concluded that "[t]here is strong competition [to HKSAR] from neighboring economies for Hong Kong's regional role in trade, finance, transportation and communications. With respect to manufacturing, Hong Kong must strive to support and further develop high-value activities. Hong Kong is also facing stiff competition from low-cost economies. A fundamental challenge is how Hong Kong should position itself in the knowledge-based, global economy of the 21st century." The report included several recommendations aimed at strengthening technological innovation within Hong Kong. These developments point to the likelihood of HKSAR being in a state of transition from the era of quality to the era of innovation.

Will HKSAR be able to make a complete transition to the era of innovation? Only time will provide the answer.

Pessimists believing in classical economic theories think that Hong Kong is too small in terms of land, technically trained human resources, and capital to be able to challenge larger and better endowed nations in the arena of technological innovation. They also point to several perceived or real cultural handicaps of Hong Kong.

On the other hand, a growing number of optimists believe that Hong Kong's cultural background already includes several ingredients essential for success in the era of innovation. They point out that the recent economic history of the developed world suggests that 'technovation' can be a very strong factor of production to the extent that it can overshadow other factors such as land, labor and raw materials. They are more impressed by the views of several modern economic theorists that entrepreneurial behavior (of which Hong Kong people exhibit plenty) will make it possible for Hong Kong to exploit some latent demand or to attack existing firms with radically new products or processes. (For instance, Schumpeter has replaced Marx's view of greed-driven capitalism with dynamic, innovative entrepreneurship, clearly differentiating the capitalist from the entrepreneur [4].)

Irrespective of the degrees to which pessimists or optimists turn out to be correct, it is clear that the degree of successful transition of Hong Kong into the era of innovation will depend mainly on (i) the behavioral patterns of Hong Kong entrepreneurs, and (ii) the innovation strategies they choose. The rest of this paper will discuss these two issues in some detail.

3. The Dominant Cultural Background of Hong Kong's People

It is generally believed that the behavior of a given set of people depends on their history, beliefs, values, and attitudes. In modern literature these attributes are often aggregated under the notion of 'culture'. More formally, culture has been defined as 'the collective programming of the mind, which distinguishes the members of one category of people from another [5, 6]."

A predominant proportion of Hong Kong dwellers are ethnic Chinese, who, according to popular opinion, have strong Confucian values albeit tempered by some British values. Hence, it is useful here to recount the four key Confucian principles as outlined by Hofstede [7]:

1. *"The stability of a society is based on unequal relationships between people*. The *wu lan*, or five basic relationships are ruler-subject, father-son, older brother-younger brother, husband-wife, and senior friend-junior friend. These relationships are based on mutual and complementary obligations. The junior partner owes the senior respect and obedience. The senior owes the junior partner protection and consideration."

2. *"The family is the prototype of all social organizations*. A person is not primarily an individual; rather, he or she is a member of a family. Harmony is found in the maintenance of everybody's *face* in the sense of dignity, self-respect, and prestige. Social relations should be conducted in such a way that everybody's face is maintained. Paying respect to someone is called 'giving face'."

3. *"Virtuous behavior towards others consists of not treating others as one would not like to be treated oneself* (The Chinese Golden Rule is negatively phrased!). There is a basic human benevolence towards others, but it does not go as far as the Christian injunction to love one's enemies. Confucius is supposed to have said that if one should love one's enemies, what would remain for one's friends?"

4. *"Virtue with regard to one's tasks in life consists of trying to acquire skills and education, working hard, not spending more than necessary, being patient, and persevering.* Conspicuous consumption is taboo, as is losing one's temper. Moderation is enjoined in all things."

Objective research is needed to evaluate exactly to what extent Confucian principles (illustrated above) continue to influence Hong Kong's industry. In particular, it is useful to evaluate the manner in which these influences affect the entrepreunereal behavior of Hong Kong people in the specific context of technological innovation. Questions such as the following are likely to arise while performing such evaluations:

1. Principle 1: Stability is clearly important when economic growth is driven by the pursuit of productivity and quality. In contrast, innovation means instability (many authors have referred to innovation as "creative destruction"). Will preference for stability impede innovation?

2. Principle 2: There is evidence to suggest that a large proportion of Hong Kong's manufacturing enterprises are controlled closely by family members of the proprietors or, even, dominant shareholders. Will this affect how professionally the corporations are run? Isn't professionalism a prerequisite to innovation in the area of high technology?

3. Principle 3: Doesn't this principle actually enable one to compete more aggressively?

4. Principle 4: Aren't such values actually assets in the context of innovation?

We present the above illustrative questions since no definitive answers for them have yet emerged. For instance, during the period when the Far East was booming (i.e., immediately prior to the 1997 financial crisis), there were several articles in influential magazines round the world extolling the virtues of 'Asian values'. Yet, soon after the crisis, several articles appeared that identified the very same values (in particular, those embedded in Principle 1) as major contributors to the crisis.

4. Corporate Cultures

Corporate cultures can be classified in many ways. For instance, van Donk and Sanders decompose organizational culture into the following six dimensions [6]:

i.   process-oriented *versus* results-oriented

ii.   employee-oriented *versus* job-oriented

iii.   parochial *versus* professional

iv.   open system *versus* closed system

v.   loose control *versus* tight control

vi.   pragmatic *versus* normative

Further, there exists considerable literature suggesting that several engineering management areas such as Quality Management [6], Business Process Re-engineering [8], Organizational Change Management [9, 10] , and Mergers and Acquisitions [11] are significantly influenced by organizational culture.

Many modern corporations behave in such a manner as to suggest that they recognize the importance of articulating and developing a specific corporate culture that suits its own specific background and competitive strategy. For instance, during the 1980s, there was much 'fear' of Japan in the manufacturing sector of the USA. The common question in the minds of many a US executive was "If Japan can, why can't we?" As a result, some US corporations started to mimic Japanese corporate cultures and practices. However, this trend petered out when Japan got trapped into a recession that started in the late 1990s and grass-roots American views on desirable corporate cultures started to reassert themselves. We make these observations not to indicate our preference to either Japanese or American prototypes of corporate culture but merely to illustrate that corporate culture is generally considered to be of strategic importance. Further, this reference to US corporations is important because, for the present at least, the USA seems to be generally recognized as a leader in technological innovation.

It is useful to examine Hong Kong's corporate cultural characteristics *vis a vis* those of countries such as the USA and Japan and other potentially competing countries. However, scientifically obtained evidence facilitating such a comparison seems to be in short supply. An exception is the work of Hofstede [5, 6] where he had examined the cultural characteristics exhibited by workers in IBM (International Business Machines) units operating in several countries (we only present a selection of the data).

Hofstede had evaluated the cultural characteristics of IBM ventures in several countries by relying on the responses provided by workers in those ventures to a common and substantial questionnaire aimed at

evaluating corporate culture [5. 7]. He then performed a cluster analysis based on the responses received. This analysis led to the identification of the four corporate cultural characteristics defined below:

1. Power Distance (PDI) indicates the extent to which a society accepts the fact that power in corporations is distributed unequally and tells about the dependency relationships in the region. A large PDI points to considerable dependence (or counterdependence) of subordinates on bosses. Subordinates either accept or reject bosses totally (polarization). A small PDI points towards preference for consultation, i.e. interdependence, between subordinates and bosses. Subordinates quite readily approach and contradict bosses.
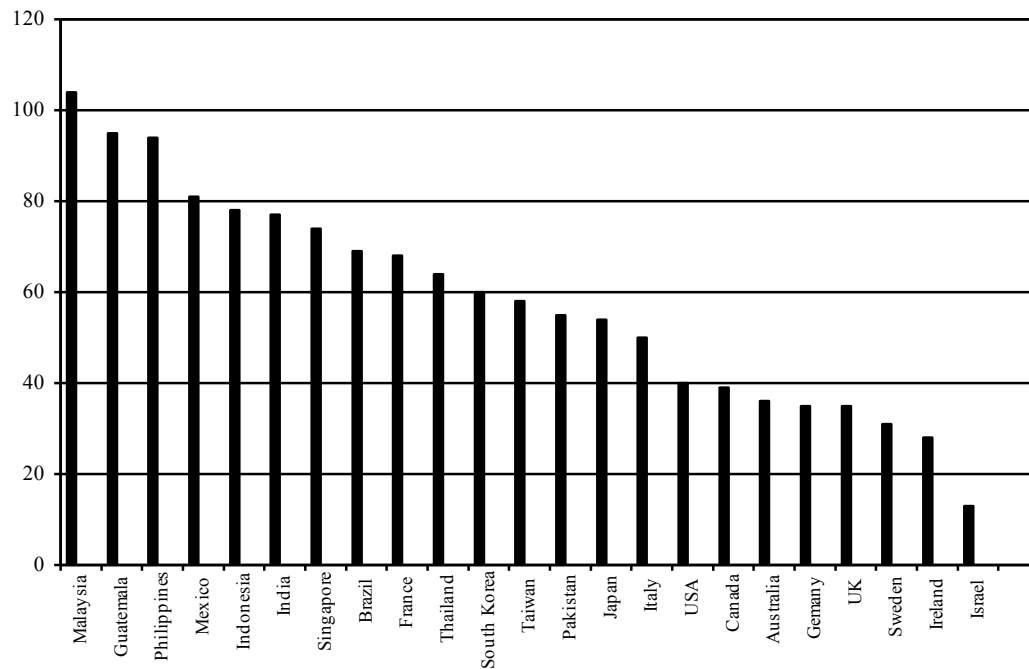
Figure 5 Power Distance Index Values

2. Individualism index (II) implies a loosely knit social framework in which people are supposed to take care of themselves and of their immediate families. The opposite, collectivism, is characterized by a tight social framework in which people distinguish between in-groups and out-groups. They expect their in-group (relatives, clan, organizations) to look after them; in exchange for which, they feel they owe their absolute loyalty to the group. A high II indicates preference for personal time (e.g., having a job that leaves sufficient time for one's personal or family life), freedom (e.g., having considerable freedom to adopt one's approach to the job), and challenge (e.g., having challenging work from which one can achieve a personal sense of achievement). In contrast, a small II (high collectivism) indicates preference for having training opportunities to improve one's skills or learn new skills, having good physical working conditions (good ventilation and lighting, adequate work space, etc.), and use of skills (e.g., being able to fully use one's skills and abilities on the job).
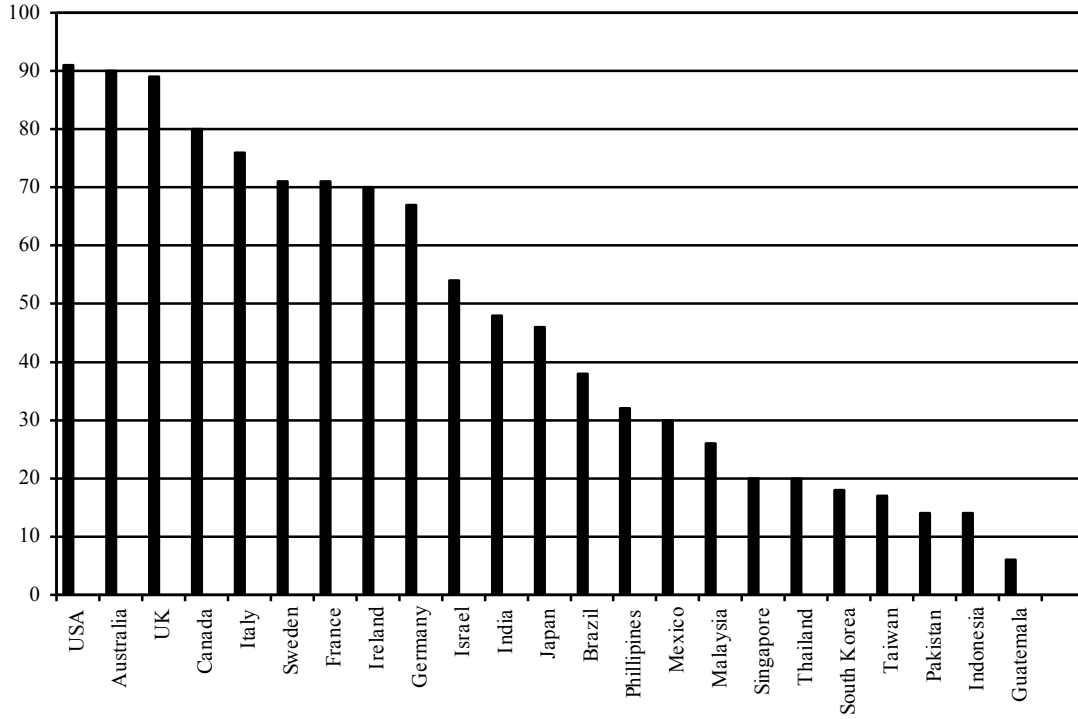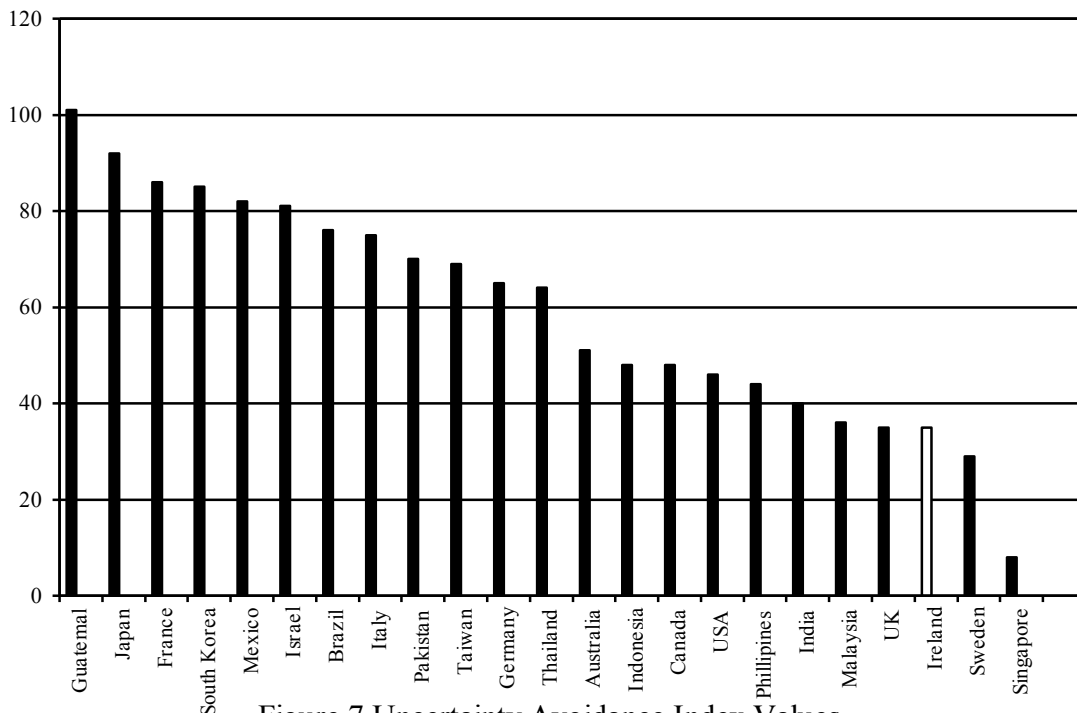
Figure 6 Individualism Index Values

Figure 7 Uncertainty Avoidance Index Values

3. Uncertainty Avoidance (UAI) indicates the extent to which a society feels threatened by uncertain and ambiguous situations and tries to avoid these situations by providing greater career stability, establishing more formal rules, not tolerating deviant ideas and behavior, and believing in absolute truths and the attainment of expertise. A high UAI indicates increased anxiety and more expressiveness. In contrast, a low UAI indicates more internalization and higher incidence of coronary diseases. Paradoxically, people with high UA tend to reduce ambiguity. They are often prepared to take risks to reduce ambiguity.
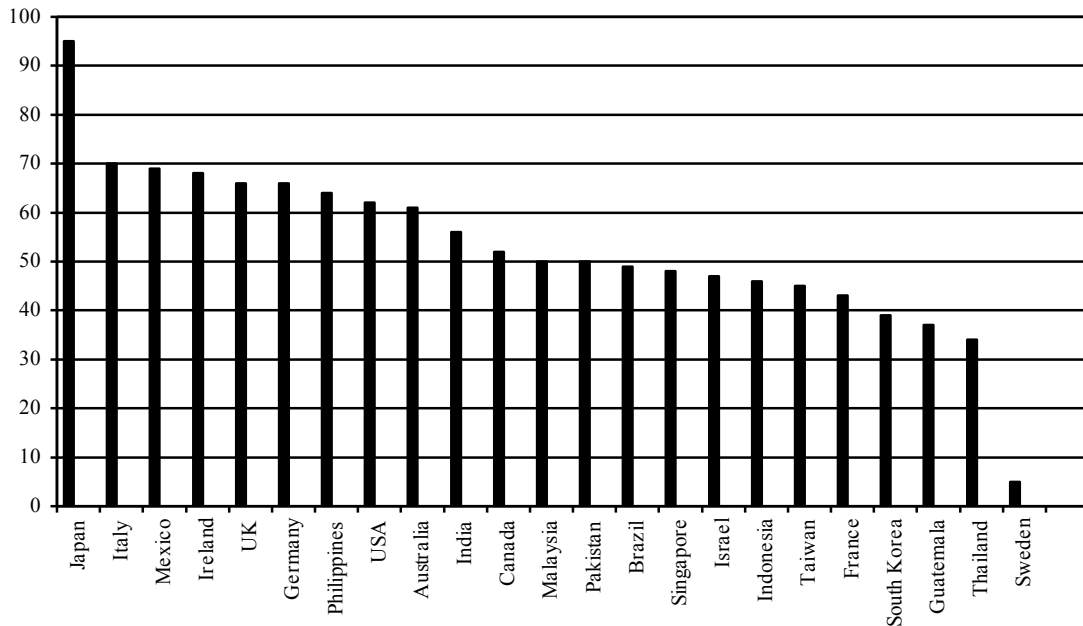

Figure 8 Masculinity Index Values

4. Masculinity Index (MI) indicates the degree to which tough values like assertiveness, performance, success and competition which, in nearly all societies, are associated with the role of men, prevail over tender values like the quality of life, maintaining warm personal relationships, service, care for the weak, and solidarity, which in nearly all societies are more associated with women's roles. Feminine societies (small MI) are characterized by a preference for good working relationship with one's direct supervisor, working with people who cooperate well with one another, living in an area desirable to oneself or one's family, and having the security that one is able to work for one's company as long as one wants to. In contrast, societies with a large MI prefer having an opportunity for high earnings, getting the recognition one deserves when one does a good job, having an opportunity for advancement to higher level jobs, and having work from which one can get a personal sense of accomplishment

Figures 5, 6, 7 and 8 show the distributions of the four indices (PDI, II, UAI, and MI) respectively across a selection of regions/nations. It may be noted that the magnitudes of the indices vary within wide ranges thus suggesting significant cultural differences at different corporate locations.

It would be useful if a specific corporation at a specific time could (somehow) use data such as those of Hofstede to obtain some insights into how it might to proceed to 'engineer' a corporate culture it deems to be best suited to its business goals. For instance, a Hong Kong enterprise intending to embrace innovation might wish to assess what cultural changes it would need to pursue. This is certainly not straightforward notwithstanding the apparently objective manner in which the data presented in Figures 5-8 were obtained. This is partly because the data are specific to IBM corporations at the specific time they were collected. One needs to be cautious in assuming that the data are relevant to other corporations at different times. Arguably, one would need to replicate Hofstede's methodology in one's own corporation. For the sake of argument, let us assume that the data can be transferred across different time periods and corporations within a given region/nation. If so, it might appear in the first instance that one could make some summative judgments about the cultural strengths and weaknesses of specific regions/nations. Again, this would be futile because what is a 'strength' or a 'weakness' would depend on the 'value(s)' being adopted in making the judgments whereas, by definition, 'values' themselves constitute a dominant part of 'culture'. Thus, one arrives at a circular argument. This indicates that one cannot make absolute judgments about the 'goodness' or 'badness' of a given culture. This is the reason that two persons with different cultural backgrounds usually end up in an emotionally charged stalemate when they engage in a dialogue directed towards comparing their respective cultures. These thoughts lead us to the notion of 'cultural relativism' which implies that one cannot evaluate a given culture in the absence of *a priori* specification of the desirable values to be adopted while making the evaluation.

However, in the context of a specific corporation, the desired values could be derived from its business context and goals. For instance, a subsidiary of a Japanese corporation in a different country might wish to achieve the greatest possible fit between its own local culture and that of its parent organization in Japan.

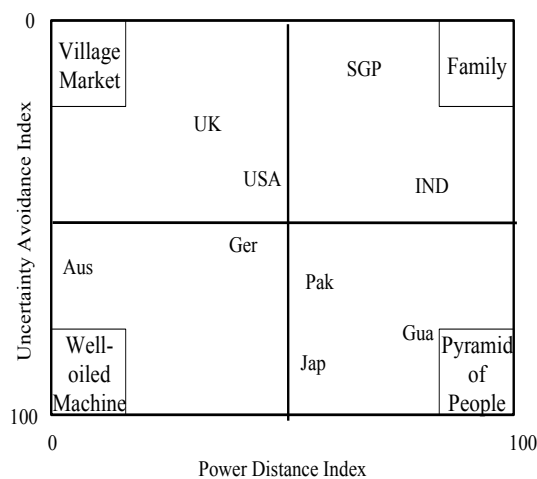Following the work of Hofstede [6] (and other similar works), there have been several

Figure 5 Four Reference Models for Corporations

attempts at developing qualitative techniques for arriving at useful judgments about corporate cultures by utilizing the empirically determined set of cultural indices. Figure 5 illustrates one such technique.

Figure 5 compares the pairs of values {PDI, II} for IBM corporations in a set of regions at a specific time [6]. The four corners of the plot represent four reference models of corporate cultures and adopt the self-explanatory labels: 'village market', 'family', 'pyramid of people', and 'well-oiled machine'. Clearly, each of these models is desirable in a different context. For instance, 'pyramid of people' is usually preferred by the military. In contrast, a 'well-oiled machine' is preferred by a crew servicing a Formula I race car.

Now, suppose that you are representing a Hong Kong corporation competing on the basis of productivity. Which reference model would you aim for? If yours was a mass production enterprise, your intuition might suggest a preference towards the well-oiled machine. This suggests a corporate culture with low Power Distance and large Uncertainty Avoidance. However, you find from Figure 5 that Hong Kong people in general have a much higher Power Distance and much lower Uncertainty Avoidance. If your analysis was correct, you would need to take corrective steps to veer the culture of your organization towards a higher PDI and a lower UAI. This assumes that corporate culture can actually be 'engineered'. Fortunately, there exist many successful case studies on corporations that have managed to purposefully modify their corporate cultures. The common features of such cases are that the transformation takes a long term and needs to be transparent, well-articulated and benevolent. For instance, to increase Power Distance, you might adopt a highly hierarchical structure with clearly stipulated lines of authority.

The desired goal would however be different if your corporation were a batch manufacturing enterprise. In such a case, you might want to go easy on increasing Power Distance by emphasizing lines of authority. Rather, you would like to encourage freer decision-making at the grass roots levels so that they can flexibly respond to changing situations. Such decision-making flexibility would become particularly important if your enterprise were a part of a globally distributed virtual network exploiting modern communication and Internet-based technologies.

When you move into the era of quality, you might need to modify the productivity-based corporate culture. The pursuit of quality requires well-trained and motivated staff. Staff need to be more empowered. A cursory review of the principles of quality propounded by several quality 'gurus' indicates that they favor 'feminine' traits such as 'cooperation", "solidarity", and "service". Thus, one might need to simultaneously nurture greater tolerance for individualism and a lower Masculinity Index.

Finally, consider the preferred culture for a corporation in the era of technological innovation. Here, it is useful to look towards world leaders in innovation such as the USA. An examination of Table 1 shows that the USA takes the middle ground in terms of Power Distance, Masculinity, and Uncertainty Avoidance whereas it exhibits the highest individualism amongst all the nations studied. The latter observation is not surprising since the pursuit of innovation needs the nurturing of individual creativity (at least within the R&D department). This view is supported by the fact that nations such as Ireland, Israel, and Italy that, in recent times, have demonstrated great flair for technological innovation also exhibit large individualism indices. There is a lesson here for Hong Kong since its Individualism Index is significantly

smaller than that of the USA. Could this be a consequence of Confucian Principle 1? Arguably, Hong Kong universities as well as corporations pursuing innovation will have to take strong steps to nurture individualism among their students and employees.

However, it must be noted that there may not be a need for a monolithic corporate culture. For instance, a design department might need to nurture a different culture than that of a production department. In a competitive environment, designers need to be highly creative. This suggests the need for greater individualism and masculinity.

(We acknowledge that the statements we have made above are mere conjectures. This is because we have not yet been able to find any informed discussions of corporate cultures that best support different competitive strategies. Our conjectures are presented here merely to catalyze discussion in the hope that, in time, the discussion will lead to a more scientific understanding of this important subject area.)

5. Innovation Directions for Hong Kong

Hong Kong's folk wisdom is that Hong Kong must find its own niche in the world of innovation since it seriously lacks natural resources and highly trained human resources. What should be the niche?

Innovations can be classified in many ways. One way is to distinguish between *induced innovations* and *Schumpeterian innovations.*

Induced innovations are motivated by such signals as shifts in relative prices of inputs into a production process or changes in output prices. For example, during the second half of the 1970s, increases in energy prices provided a strong incentive for firms to produce innovations that conserved energy or substituted other inputs for energy. Since Hong Kong has no natural resources, the question of it engaging in induced innovations does not arise.

Schumpeterian innovations are the result of 'entrepreneurial behavior' — the perception that it may be possible to exploit some latent demand or to attack existing firms with radically new product or process. Here lies the strength of Hong Kong. The entrepreneural maturity of Hong Kong is well known. However, much of this entrepreneurial experience lies on the business side (service sector). Experience in technological entrepreneurship is weak. The main repositories of technological knowledge so far have been the manufacturing and engineering (utilities, transportation companies, construction companies, etc.) sectors. However, the engineering sector has generally preferred high technology acquisition rather than technology generation. The manufacturing sector had occasionally shown flair for product innovation in some fairly advanced technological areas. But, the migration away from Hong Kong has been diverting the attention of Hong Kong manufacturers. Companies with a well-articulated R&D policy are very few. The implication is that Hong Kong's dreams with regard to technological innovation would not be realized unless its manufacturing sector commits itself to establishing a strong R&D infrastructure through forward looking policies. At the same time, a conscious shift in corporate culture towards greater individualism, lower power distance and masculinity is needed. This is not an easy task given the entrenched culture that is more tuned to the eras of productivity and quality.

Even if Hong Kong's manufacturing and engineering sectors have been able to foster technological innovation, the limited size and range of effort that it is likely to muster could still turn out to be a handicap. According to classical theories of technological innovation, this limitation implies that, even in the long term, Hong Kong would not be capable of engaging in radical innovations. In other words, Hong Kong may have to be content with innovative enterprise at the level of *incremental* product innovations. The recent work of Christensen [12] however suggests otherwise.

Christensen has made an extensive and deep analysis of innovation trends in several industry sectors (hard disk drives, cable excavation, integrated steel making, discount retailing, motor control and printers, logic circuitry, computers, personal digital assistants, software, motorcycles, electric vehicles, insulin, etc.), and arrived at several interesting and unconventional conclusions [12]. He classifies technologies into two basic types: *sustaining* and *disruptive*. "Some sustaining technologies can be discontinuous or radical in character, while others are of an incremental nature." "What all sustaining technologies have in common is that they improve the performance of established products, along the dimensions of performance that mainstream customers in major markets have historically valued." Thus, according to Christensen [12], seemingly radical innovations such as the replacement of ferrite oxide coatings on disk heads and disks by thin-film coatings or of replaceable disk packs by Winchester drives were basically of the sustaining type since the market continued to remain with industry leaders even after such innovations. However, Christensen goes on to note that, "occasionally, disruptive technologies emerge" that "bring to a market a very different value proposition than had been available previously." An example of a disruptive innovation is the 8-inch disk drives that replaced 14-inch drives. However, generally, "disruptive technologies underperform [at least in the near term] established products in mainstream markets. But they have other features that a few fringe (generally new) customers value. Products based on disruptive technologies are typically, <u>cheaper</u>, <u>simpler</u> [made from off-the-shelf components], <u>smaller</u>, and, frequently, <u>more convenient to use</u> [our underlines]." This last observation by Christensen could be of great value to Hong Kong entrepreneurs since it points to the fact that being small need not be a handicap. Hong Kong may be small in terms of R&D infrastructure. Yet, by carefully selecting a market-savvy innovation strategy and nurturing a culture of innovation, it can certainly hope to seize leadership in selected industrial sectors.

References

1. Patri K. Venuvinod and V. A. Ostafiev, "Successes, False, Starts, and Promises in Manufacturing Engineering: Contrasting Perspectives from Hong Kong and Ukraine," 17th All India Manufacturing Technology, Design and Research Conference, Regional Engineering College, Warangal, India, 9-11, Jan. 1997.

2. Mark O'Hare, *Innovate: How to Gain and Sustain Competitive Advantage*, Basil Blackwell, 1988.

3. Asiaweek, September 22, 2000, page 75.

4. Joseph A. Schumpeter, *Capitalism, Socialism, and Democracy,* HarperCollins Publishers Incorporated , 1976.

5. Geert Hofstede, *Cultures and Organizations: Software of the Mind*, McGraw-Hill, 1997.

6. D.P. Van Donk, D.P. and G. Sanders, "Organizational Culture as a Missing Link in Quality Management, International Journal of Quality and Reliability Management," Vol. 10, No.5, 1993, pp. 5 –15.

7. Geert Hofstede, *Culture's Consequences*, Sage, Beverly Hills, 1980.

8. Stephen Campbell, and Brian H. Kleiner, "New Developments in Engineering Organizations," Work Study, MCB University Press, Vol. 46, No. 3, pp. 99-103, 1997.

9. Sandra Hill and Des McNulty "Overcoming Cultural Barriers to Change", Health Manpower Management; Vol.24, No.1, pp.27-32, 1998.

10. George Graen and Chun Hui, "Managing Changes in Globalizing Business - How to Manage Cross-cultural Business Partners," Journal of Organizational Change Management, Vol. 9, No. 3, pp. 62-72, 1996.

11. .Mitchell Lee Marks, "Consulting in Mergers and Acquisitions - Interventions Spawned by Recent Trends", Journal of Organizational Change Management; Vol.10, No.3, pp. 267-279, 1997.

12. Clayton M. Christensen, *The Innovator's Dilemma – When New Technologies Cause Great Firms to Fail*, Harper Business, 2000.