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# ESTIMATING THE INTANGIBLES:

# A CULTURAL COMPATIBILITY ASSESSMENT

# MODEL FOR TECHNOLOGY TRANSFER

DISSERTATION

Presented in Partial Fulfillment for the Requirements for

the Degree Doctor of Philosophy

in the Graduate School of the Ohio State University

By

Jiten V. Ruparel, M.A.Sc.

* * * * *

The Ohio State University

1998

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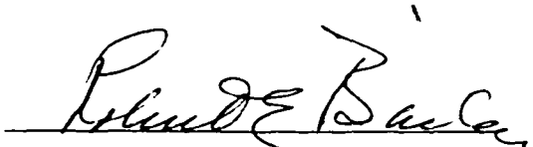

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## ABSTRACT

Technology transfer is an interdisciplinary and multivariate study of how innovations (products, processes or capabilities) are introduced into a society. As a nation the United States spends in excess of $110 billion a year in research and development in its universities, federal laboratories and privately funded R&D programs. While America is the most creative of societies and is willing to try new products and processes and is renowned for its fundamental scientific research, it is not as efficient at converting research results into commercially viable products. Its speed to market is exceeded by the Japanese, who are able to take research results and successfully fund and nurture pilot or demonstration stage innovations to market-ready status in a shorter period of time. There is a general lack of understanding as to how one effectively transfuses a technology into a social group, be it a different culture or subculture. Up to now, culture has been aggregated as an intangible that is recognized but not systematically assessed for international technology transfer situations especially with emerging countries whose historical and social traditions are very different.

Existing technology transfer literature tends to have a built-in pro technology bias and a donor bias, both of which impair one's understanding of the difficulties of the technology adopter or host society.

A robust comprehensive theoretical framework or model is needed to organize cultural variables in a manner that enables technology transfer professionals, corporate decision makers and government policy analysts to both qualitatively and quantitatively asses which variables are relevant to the introduction of a particular new technology into a social group at that time-and why.

This dissertation presents a comprehensive and systematic approach to assessing the interaction between an incoming technology and a host society in a framework that is useful for technology transfer planning, implementation and review by the technology provider and the technology adopter. It creates a matrix - a grid which has technology attributes organized along vertical columns and cultural variables organized along horizontal rows. Technology attributes include, in addition to technology and infrastructure aspects, the financial, business, legal, environmental, social and political aspects of the impact of the new technology- the gestalt. Cultural variables are organized into four overlapping categories : artifacts, behavior, shared assumptions and beliefs.

The intersection of cultural variables and technology attributes is called a cell which is characterized by four numerical scores: one each for cultural reactivity, cultural depth, probability of intersection and the fourth which is a product ( multiplication) of the other three and represents a rating or score for the interaction.

One such Cultural Assessment Matrix (CAM) is completed by the technology provider and an independent one completed by the technology adopter during the technology transfer planning, implementation and review stages. These two matrices constitute one pair (CAMP). One pair is completed at the planning, the implementation and the review stages. This helps in overcoming the pro-technology and donor bias and helps communication by fostering cultural empathy in the technology provider and technology appreciation in the technology adopter. The entire process is called Cultural Assessment Matrix Pair Sets (CAMPS).

The approach was developed with the backdrop of US- SE Asia technology transfer in general, and the Indonesian automobile industry in particular- How can technology transfer methods help the establishment of an Indonesian automobile industry? Research was conducted at the National University of Singapore and discussions were held with industry executives in Singapore and Jakarta to refine the model and to better understand the technology adopter's perspective and the role that culture played in their technology adoption process.

Results indicate that the CAMPS approach holds promise. The method is not restricted to any culture, technology, organizational, political or geographic setting. It can be applied to technology transfer within an organization, between organizations and between countries. Aspects that call for further research have been identified.

Validation of the model will require application of the CAMPS approach to technology transfer projects in different countries and with different technologies. The acquisition of systematic and objective recorded cultural assessment data related to technology transfer that will accrue over time will help overcome the present paucity of such data and permit better comparative assessments, preparation and planning as more experience with the approach is gained.

## DEDICATION

Dedicated to my wife Sunita

## ACKNOWLEDGMENTS

I acknowledge my adviser and friend Dr. Robert Bailey who sensed some potential in me years ago and encouraged me to return to college to fulfill my dream and potential. He has helped me transform my life.

I would like to thank my advisers Professors Roger Blackwell, Edward Jennings and Richard Moore for their guidance, constant encouragement and for holding me to high standards.

I thank law professors Daniel Chow and Kathy Northern for their teaching and mentoring.

Professor Keong Leong is thanked for his constant encouragement all along.

This research was partly supported by the Center for International Business in Education by a 1997 Summer Grant which was ably administered by Melynda Benlemlih. Cheryl Ryan and mentor Toshikata Amino are thanked for their insights and referrals.

My fellow graduate students at Ohio State are recognized for their stimulation .

I appreciate the fellowship of Adrian Thomas, Yohannes Somawiharja and others at the Ohio Applied Technology Transfer Services family.

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## SECTION 1

## THE NATURE OF TECHNOLGY TRANSFER

This section presents the motivation for this research and then it proceeds to (1) examine selected aspects of culture that are relevant to technology transfer and the study of the interaction between an incoming technology and an adopter society (2) to define key technology management terms that will be used to ensure consistency in this dissertation and (3) to review some aspects of technology transfer that were used to develop the framework which will be presented in Section 2.

References are listed in section 9. Where specific quotes or ideas are used in the development of this dissertation, they are referenced within brackets. For example [9.1.12] is reference #12 in category#1(technology transfer) and is Professor Robert Bailey's paper : The Development of a Practical framework for International Technology Transfer. Not all entries in section 9 are referenced; several of them are provided as a useful bibliography and would be of interest to future researchers and scholars.

Occasionally, the language of this dissertation may lapse into the first person plural. This happens in quotations as well. It is requested that this not be interpreted as a sign of ethnocentricity or lack of cultural appreciation of other societies. The pronoun he is frequently used when referring to a technology provider or technology adopter. It is not meant to gender specific and should be taken to include the pronoun she.

1.1 Rationale for this research.

Technology transfer is an interdisciplinary study of how innovations (products, processes or capabilities) are introduced into a society. It is an emerging field of study that is multivariate in nature. As a nation, the United States spends in excess of $110 billion a year in research and development in its universities, federal laboratories and privately funded R&D programs [9.1.9]. While the US is the most innovative of societies and is recognized for the quality, breadth and depth of its original scientific research, it is not very efficient at transforming research results into commercially viable products; the return on investment is far from satisfactory. Despite its creativity, its willingness to try new products and to take risks, the United States has been recently relative slow in commercializing its innovations; the Japanese, in particular, have profited greatly from their superior 'speed to market'. They have also taken research findings of others at the proof-of principle stage and funded the transition to demonstration and eventual commercialization to their great financial and strategic advantage.

There is a general lack of understanding as to how one effectively transfuses a technology into a social group, be it a different subculture or culture. Opportunity costs are also high because a traditionally constituted technology or business unit is not in a position to systematically plan, implement or measure a technology transfer activity. There is considerable published literature on some aspects of technology transfer such as product acceptance, diffusion theory, organizational influences and communication theory. However, existing literature has a pronounced pro-technology and donor perspective bias that is keeping us from understanding the receiver's perspective and difficulties and performing better; this needs to be remedied.

Up to now, culture has not been treated comprehensively or systematically. It has been aggregated as an intangible that can be qualitatively discussed but not quantified for real life business technology transfer situations, particularly international ones and especially with lesser developed countries and those with greatly different social and historical origins. The adaptation or 'acculturation' of a given technology to a target host society is also not well understood. Efforts that lead to better insights in this area will pay rich dividends.

There are numerous cases of poorly conceived and executed technology transfers that failed early in their lifetime because receivers lacked appreciation of the technology and because they were not prepared ( ready) for it. Lack of management skills in the adopter organization has also been a significant contributor [9.1.2, 7, 9, 12, 18 and 19]. The

transfer sometimes did not succeed because the provider failed to understand the receiver's perspective and to anticipate the cultural reactions and resistance to the new technology. In some instances, the technology adopter did not participate sufficiently in the technology selection or implementation planning. In many cases, cultural analysis and empathy would have helped. In international transfers, particularly in developing countries, additional challenges are presented at the receiving end because of inadequate physical, commercial/financial/legal or technical infrastructure. Language and compatibility with local social behavior, values and belief systems are other important issues that have not received proper analysis. "Research has shown (Tung,1988; Black, Gregersen and Mendenhall, 1992) that failure in the overseas business setting most frequently result from an inability to understand and adapt to foreign ways of thinking and acting rather than from professional and technical incompetence"[ pp.7, 9.4.26]. There is also the issue of correct timing , but that is not included in this research since it is a general business topic not tied to technology transfer as such.

In addition to successful initial transfer, there is the issue of technology integration and sustainability. Quite often the new technology implant works, but after some time, problems start to surface. Lack of a comprehensive analysis in the past resulted in insufficient preparation at the receiving end which, in turn, prevented the new technology from flourishing in its new location [9.1.18].

There is increasing recognition of the difficulties of initiating and sustaining a meaningful dialog between technology developers and corporate/government decision makers who establish policy. With saturated domestic markets and increasing global opportunities (markets, human and material resources, capital, supply/demand chains etc.) and operations (direct investments, joint ventures and strategic alliances), the United States is becoming more and more linked with other economies and nations whose historical roots and cultures are very complex and are quite different . Some would even say that with regional trade groupings ( e.g. APEC, NAFTA), the US is moving beyond global connectedness towards potential economic interdependence and integration on an unprecedented international scale[9.1.21 and 22]. The current Asian currency crises is an example of the severe financial and political turbulence that can be encountered by emerging markets and how it can affect the US domestic situation. Interdependency can be unsettling for both parties. There is a loss of control on either side. The leverage changes because the fulcrum point shifts over time.

As the US moves more and more into an intensely globally competitive world, technology assumes an increasingly crucial role as one facet of competitive advantage. The stakes are getting higher. Technology is being used to compensate for wage differentials between developed and developing societies; it is also being applied to achieve product quality and consistency demanded by the marketplace.

Technology transfer is more commonly specified as an integral part of large development and infrastructure contracts. Without the successful and efficient transfer of technology, the US will not realize the gains it deserves due to its creativity.

New technology is being developed and introduced at an ever increasing rate. It outpaces the ability of societies to adapt to it. Societies are complex organisms that have a longer time constant. Forcing the pace causes stress. As communication in the world improves and interactions increase and societies seem to become more alike on the surface, individual societies seem to value more the deeper aspects of its unique culture. Societies are not willing to give up centuries of development and tradition , especially of their cherished and enduring institutions such as political, legal and educational systems. New technology is getting increasingly closer to fundamental scientific knowledge. DNA manipulation, genetic engineering and such technologies are at the very edge of scientific understanding. These technologies appear to be ahead of our understanding of the social implications of their deployment. This adds to social distress[9.8.51 to 56]. Less technically advanced societies are concerned that they are being run over in this headlong rush. Heightened awareness of the value of indigenous knowledge, biodiversity and rights of indigenous people( hard to define) makes societies more watchful of the impact of technology on the 'quality of life around our small planet'[9.2.1 to 5].

The World Bank is reconsidering the wisdom of building large hydroelectric dams that can potentially disturb the ecological balance. There appears to a growing mood that future technology transfer should try to minimize social distress[9.1.22].

With sound predictive analytical models, one can greatly enhance the quality of decision making. A robust comprehensive theoretical framework or model is needed to organize cultural variables in a manner that enables technology transfer professionals, corporate decision makers and government policy analysts to both qualitatively and quantitatively assess the short term and long term consequences of introducing a new technology into a social group at a particular time. The intellectual framework presented in this dissertation is one such model.

The time taken to conduct a cultural compatibility assessment proposed by the model is an investment , not an expense. The payback in terms of improved chances of success, clarity of purpose, agreement of approach and metrics is likely to be comparable to the benefits derived by the matrix method also used by the Quality Function Deployment approach in engineering management [9.4.5].

## 1.2 Discussion of Major Terms

### 1.2.1 Culture:

'Culture is learned, shared , transmitted from one generation to the next, and multidimensional; that is, any changes in one dimension will affect the other dimensions' [9.1.12]. Culture follows its own trajectory, which is often not predictable from the outside.

Culture is complex, interactive and dynamic and it permeates a society. In the technology transfer profession, its value is implicitly recognized and many efforts have been made to deal with specific aspects of culture. One needs to avoid an over reliance on cultural generalizations and over simplifications [9.4.26].

Anthropology is the study of cultures. It is extremely broad . One branch of that science is cultural anthropology, of which, business anthropology is a specialty and organizational anthropology is a sub-specialty. There is overlap with the field of organizational behavior as studied by management students . Concepts have been borrowed from these fields and shaped for this research.

Cultures have a very *long time* constant and frequently outlive political and social institutions. Culture is inherently conservative . It can be thought of as 'damping' in a system to smooth out external perturbations. Habits of the collective mind of societies is called 'cultural persistence'. 'As more and more Western business practices are introduced, there is an increasing emphasis on maintaining one's own unique cultural

values' [p.5, 9.4.4]. Although US management practices are being increasingly adopted in Asia by senior managers, it would be an error to believe that corresponding cultural adaptation is occurring at the middle and lower management ranks.

Technology transfer professionals need to be aware of the possibility of cultural stratification at various organizational levels as well as in different line functions, particularly if the organization is large and complex. There may well be several cultures concurrently in existence within such corporations.

Culturally alien, but sought after ideas and practices, become reinterpreted in terms of what are perceived as more 'traditional' values. In Asia , old hands say that sometimes imported ideas are 'Japanized' or 'Indianized' or 'Sinicized' over time. Technical artifacts are also sometimes modified for local conditions and preferences.

The 'professed' values and belief systems of a society may be at variance with observed behavior ; the 'operative' values and belief systems influence behavior. This difference can catch a new comer to a culture off-guard. Differences between a society's ideals (or how it would like to portray itself) and reality, pose a vexing problem for researchers and is one of the reasons that anthropologists believe in first hand extended immersion in the local culture. This problem also exists when examining corporate cultures.

'The idea of incompatibility of cultures tends to come mainly from an ideological construction of unequal relationships of power between two cultures' [pp.293, 9.7.4].

'It is helpful to think of another culture as analogous to music: (a) if another person has not heard it, it is impossible to describe, (b) before the days of the written score, people had to learn informally by imitation, ( c) people were only able to exploit the potential of music when they started writing musical scores'.

Discussions often surround the concepts of emotion versus reason in business decision making. 'Americans tend to exhibit emotion yet separate it from objective or rational decisions, Mediterranean people tend to exhibit as much if not more, but do not separate , Dutch and Swedes tend not to exhibit emotion yet separate it from their deliberations. You could argue that emotions held in check will distort judgment despite all efforts to be rational. Or you could argue that emotions make it harder for anyone present to think straight! The whole notion of rationality as a category of thought separate from emotion is a cultural preference" [9.8.42]. This distinction between emotion and decision making is useful in trying to understand communications in cross-cultural settings.

Different cultures have evolved learning methods that match their heritage and environment. The Chinese script, for instance, is visual. Mandarin characters 'draw' the word that expresses a concept. This is one reason why there are so many 'characters' in the script. Japanese and Korean writing belong to that tradition. The Japanese are highly

visual. When one adds to this their famed thoroughness (attention to detail) and incremental improvement , one gets to the reason why their technology managers photograph everything. They pore over the stills, replay videos in slow motion and get a good idea of scale, spatial relationships and detail. Indians, on the other hand, have a language that is extremely phonetic and syntactically consistent. Much esoteric learning in the past was restricted to elite castes and was passed on by memorization and by coding the information in allegories. This ancient oral tradition has meant heavy reliance on face to face instruction and verbal instruction. The Europeans have tended more towards textual recording and transmission of data, information and knowledge. The language grew with the need to integrate new concepts and applications and became very powerful. There are cultural attitudes that can become learning disabilities[ pp. 79, 9.2.36]. The following are a few caricatures: (1) I am my national culture. This overvalues the role of culture. In extreme cases, it can lead to paranoia and avoidance of anything imported. The French suffer from periodic bouts of this malaise. (2) People from other cultures are my enemies: they are out to subvert or corrupt us. This is the hostage mentality. The current conditions in Iraq and Iran are offered as examples. The Chinese rejected the printed book because it threatened the importance and social value of calligraphy. (3) It is my duty to use my culture as a model to help others who do not have a culture. This is the colonial and missionary mind set. (4) My culture has the answers, others do not. This is indicative of a strong bias that goes beyond confidence. (5) I understand the other culture because I have visited them. This is the globe trotter syndrome . The individual(s) spends more time being critical of the differences rather than trying to understand the foreign

culture. (6) Culture is irrelevant; technical competence and superiority is enough. This comes from being too narrowly focused, close minded, immature and/or inexperienced. (7) My culture is superior because it is the earliest and has been around the longest and can still show the younger cultures a thing or two. This is the old-age syndrome and is sometimes exhibited by India ,China, Egypt, Israel etc.

'The word context expresses the aspect of culture concerned with human relations as a function that facilitates communications. This enables us to treat different cultures in terms of ,so to speak, degrees of difference. According to this notion, Japan is a high context society because its culture provides its members with a rich background of shared information that facilitates efficient interpersonal communications. On the other hand, in the United States, meticulously organized communication and conduct is necessary to maintain human relations in a low context society'[9.8.31]. Allied to the concept of context is the notion of multi-stranded relationships. In situations such as small company towns and family owned businesses, the complex ties to different facets of social transactions modify personal behavior in the business context. Close knit societies and strong kinship are other outside factors that influence business behavior. Section 3-15 covers this in more detail.

Individual and collective behavior has been studied in general. In an organizational behavior setting, it is interesting to note that individuals in a society often behave differently than when they are in organizations. Americans as individuals are very

democratic in their family and social lives, but can be autocratic decision makers in large corporations. Americans seem to separate their work and social lives. The Japanese male is renowned ( rightfully or wrongfully) for his feudal relationships with other males in Japanese society Yet in a business setting, the striving for responsibility and concern for subordinates and the efforts towards consensus are a marked contrast to US practice. Social relationships are not checked in at the door when Asian businessmen get to work. In the US, jobs are a legal contract. In many other societies employment is a social contract. This is also changing as Asian companies try to compete in the global marketplace. This has profound implications on hiring and firing, retrenchment and retraining, union-management relations and human resource management.

Human rights is a public policy issue that the US has linked to international trade. This complicates matters since it implies that other countries are less 'civilized' . As part of its mantle of leadership, Americans push individual freedom along with democracy, open markets and free trade. Unlike Western governments which see human rights as revolving around the individual, there is in Asia and Africa, a strong notion of rights of the community, the nation. This has a lot to do with colonial experience of Asian and African states. Subjected to alien , colonial rule for centuries, fighting for freedom for a whole generation of Asians came to mean fighting for the community more than personal freedoms. Even in countries such as Nepal and Thailand that have never been subjugated, society has defined the welfare of the community as higher than that of the individual.

The US has also linked international trade to its foreign policy. This greatly complicates matters. Most Favored Nation Status and access to US markets are linked to political alignment and political and economic reform.

Gift giving is frequently misunderstood in cross cultural exchanges. Anthropologists have studied this social transaction[9.2.32, 45]. 'For most donors...there is no formal contract, no legal bond, no situation of power, domination, constraint or compulsion, no sense of shame or guilt, no gratitude, imperative, no need for penitence, no money and no explicit guarantee of or wish for a reward or return gift'[ pp.89, 9.2.24]. A simple gift with no strings attached. However, there are situations which are quite ambiguous. Here there can be hidden motives of market clearing and exchange, expectations of reciprocity and intent to compromise and influence and also to put under social obligation. . There are direct exchanges, indirect ones, horizontal and vertical , generalized versus balanced. There are no general rules available other than local custom and tradition to serve as guide. One should be careful not to jump to conclusions or impute motives. Tact and diplomacy are called for.

In America, community and government relations or public affairs is very much on the minds of senior managers since it reflects corporate image. To that end, companies donate money and get involved in community activities. In Asia and else where, it is only recently becoming recognized for its potential effect on bottom line profits. The actual practice of this function is very culture specific.

Community relations differs from other technology transfer management functions in that the primary motivation is not transplanting methods of production but adaptation to the local community.

### 1.2.2 Technology Management

Please refer to Figure 1.1 , which is a visual representation of the relationship between key terms . Time and technology development flow from the top of the page to the bottom. Knowledge: In addition to the dictionary definition of knowledge, phrases such as 'knowledge is power", 'the knowledge revolution' and 'the knowledge society' are gaining currency. In his recent book 'The Knowledge Creating Company'[9.8.40], professor Nonaka elaborates on two types of knowledge(first postulated by Michael Polanyi in 1966) called explicit knowledge and tacit knowledge. 'Explicit or codified knowledge can be formally recorded and transmitted. Tacit knowledge is personal, context specific and therefore hard to formalize and communicate. Only individuals create knowledge. Organizations support creative individuals and provide contexts for them to create knowledge. Asians look at knowledge differently. It is in the transition from tacit or implicit knowledge to explicit knowledge and in interaction with others that organizational knowledge is created and organization learning occurs' [9.8.40].

When knowledge is created, it is like a baby. It has infinite potential but needs time and effort to mature before it can contribute to society. Knowledge is made explicit and then by the dint of individual creativity, a new idea is born. This idea has to be captured and put

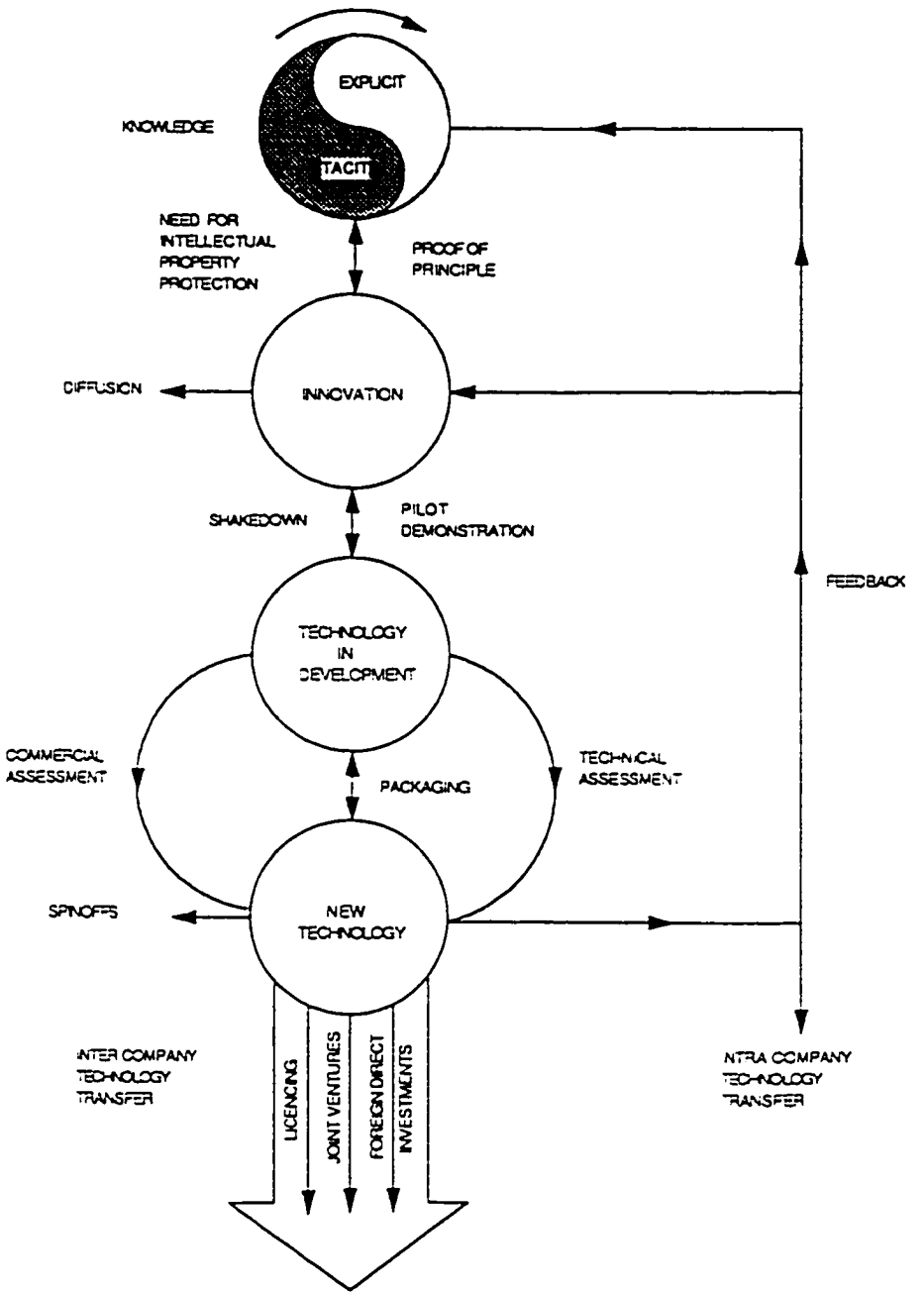



FIGURE 1.1 RELATIONSHIPS OF KEY TERMS IN TECHNOLOGY TRANSFER

forth for adoption. It has to be examined and a proof of principle demonstrated within the organization. In his book 'On Asia", Peter Drucker makes a penetrating observation: 'A specialist is a knowledgeable person, but he is not automatically an educated person. An educated person is capable of relating an area of special knowledge to the universe of knowledge and human experience'[9.8.3]. Once a novel idea has been so related and suitable intellectual property protection measures are taken, one has the makings of an innovation. R&D labs and universities usually lose interest at this point (the intellectual satisfaction has been derived, the papers published, the torch of knowledge has been passed on and also R&D funding is usually provided for pure research, not active commercialization). They are ready to move on and let the diffusion of innovation process take over. Note the remaining steps that have to be taken before business funding comes in. It is here that we lose out. 'There is a funding gap. This seems bizarre in a country that spends as much (on research) as Japan, Germany, France and UK combined. The US government funds most of this country's early technology development, whereas industry funds the later stages of scaling up the technology into full production. The problem is that there is a lack of funding for demonstrating technologies at small production levels or building the first pilot plant. Much of our technology has languished in this gap, only to be recognized by foreign competitors and developed abroad'[9.1.9]. Necessity may be the mother of invention, but competition drives innovation. There is no better economic propellant than competition. The higher up the flow in the process, the greater the risks and rewards. Some high technology may be too expensive for commercial application

without substantial modification. Industrial customers stress that re-engineering and redesign costs often greatly reduce the original estimate of the value of the innovation by the inventor. Venture capitalists operate all the way between proof of principle and the shiny new technology in the showcase [9.5.2]. The innovation has to demonstrated either by a prototype or other means, alternative implementation strategies and design choices have to be explored, difficulties of scaling up and a host of other development activities have to be undertaken. Now there is a technology in development. Next, technical and commercial viability assessments logically follow. Past this hurdle, one has a new technology. Feedback to the R&D process and preparation for intra-company transfer can now be formally pursued. For external markets, this technology needs to be packaged. 'Both the scientific and economic proof are needed for the buyer as well as the user benefits. The key to packaging this crucial information that accompanies the technology is the clarity the incentives of buying and using the technology. Successful packaging tends to be in the vernacular of the prospective buyer, who paradoxically may not be interested in, or fully conversant with, the scientific principles on which the technology is based' [pp.107,9.1.2]. Entrepreneurs can now take this technology to the market. Their willingness to take risks is central to its chances. Neither inside or outside mechanisms have been excluded . Another set of options is by technology transfer to other organizations by licensing, joint ventures or direct foreign investments.

The technology market is different from a product market and it is important to understand the differences. Unlike the sale of a good where the transaction is completed

when physical delivery takes place, the transfer of skills and information is a prolonged process. Control of technology imports has been common among developing countries. The international technology market is one of the most imperfect of markets. There are large elements of monopoly or oligopoly. Information on sources and products is often fragmented and costly to collect. It is difficult for the buyer to evaluate the real value of the product or the going market price. The product itself has some public-goods properties, since it relatively expensive to create but cheap to disseminate and the initial stock does not diminish with the sale. Governments in many developing countries have been disposed to impose controls on technology transfers by creating regulatory bodies such as technology review boards to improve their bargaining stance. This has added further imperfections to the technology market.

Summarizing the situation on the international level, 'technology is traded under non-competitive conditions. A prospective buyer of technology suffers from inherent weakness in formulating his demand. His bargaining power is the determining factor that settles the term of the exchange' [pp. 23-54, 9.1.20].

Standards are very important in the introduction and integration of new technology. Competing standards can slow down the acceptance of new products. The lack of an international standard on High Definition TV (HDTV) has held up introduction of this technology into the US market for years. There are huge commercial implications of

adopting a standard, particularly when a company or country has invested heavily in a technology that is going to become the basis for the new standard.

The technical leader, whose approach becomes a standard, garners the greatest profits and pulls the industry towards its philosophy. The fight for dominance in personal computer operating systems is a recent example.

## 1.3 The Nature of Technology Transfer

Technology transfer is frequently a misunderstood concept. Some people are under the impression that technology transfer consists in handing over an integrated set of handbooks, parts and instructions that is complete and usable - like a kit car or ultra light hobby airplane. This misunderstanding is more prevalent in companies whose activities are not technical in nature or whose management are innocent of science and technology beyond what they endured in high school. This view is also encountered in political circles. This misconception underlies much of the difficulty of communication between public policy officials and members of the technical and financial community as evidenced by media coverage of the tensions between Silicon Valley, Wall Street and Washington. This has been discussed by Joseph Schwartz [9.7.2], Ruel Howe [9.7.7] and C.P. Snow [9.7.8].

Each technology transfer needs to be individually handled. Notwithstanding the various forums, mechanisms and arrangements, technology transfer is part of technology management and needs to be managed as such.

Experts agree that technology management entails greater risk than most manufacturing and service business operations; on the other hand, potential payoffs are much larger.

### 1.3.1 Lack of unique taxonomy

'There are many models of technology transfer, as any perusal of the literature will show- partially because there are so many options for the transfer of a technology within the confines of the marketplace, classroom, professional society, or governmental facility'[9.1.12]. Technology transfer has been practiced and studied for decades in very many different disciplines without any unifying theoretical schema. It is no wonder then, that there are numerous definitions and perspectives which are valid within their specific context. Everett Rogers, a rural sociology professor who taught at Ohio State University at one time, was one of the first to bring various approaches under his definition : 'Diffusion is the process by which an innovation is communicated through certain channels over time among members of a social system'[pp.5, 9.1.11]. His influence in this area continues to be felt. Business managers and organizational behavior researchers think of technology transfer in terms of change and change management. Marketing professionals couch it in the dialect of product life cycle and market acceptance. Economists studying how lesser development countries can grow, think of technology as a necessary resource and its transfer a requisite somewhat like intellectual capital. Lawyers relate to licensing and intellectual property protection. Engineers and scientists emote with systems theory and use the thermodynamic metaphor of reducing entropy in a system. Each discipline has contributed to the understanding of this interdisciplinary and multivariate process.

The earlier discussion of key terms in section 1.2 is intended to present the notions that match the development of the framework of this dissertation. 'There appears to be a need for a paradigm which is general and can cover all these transfer methods'[9.1.12]

1.3.2 Secondary and tertiary effects of technology transfer.

Joseph P. Coates studied technology assessment-'the systematic study of the effects on society that may occur when a technology is introduced, extended, or modified, with a special emphasis on the impacts that are unintended, indirect and delayed' [9.1.25]. The undesirable, indirect and unanticipated consequences of innovations usually go together, as do the desirable, direct and anticipated consequences. Change agents frequently do not sense or understand the social meaning of the innovations that they introduce. Satellite TV caused a small social change in the US, but it hastened the break up of the Soviet Union. In Singapore and some other countries, satellite TV is government monitored and controlled. One of the major lessons learned from exposure to the approach of ethnography and other methods of anthropology has been the raised awareness and willingness to acknowledge and search for the unexpected and prepare for the undesired side effects of technology adoption. The cultural assessment approach researched in this dissertation is aimed at identifying as many of these at the planning stage as possible.

Technology can reduce variety and diversity. Power looms have been systematically driving small local dyers and hand loom weavers out of business for close to two hundred years. This has greatly reduced the variety and artistic expression that found outlet

through textiles. Fast food technology is reducing the culinary diversity of Europe and Asia. Movies and TV tend to overwhelm live entertainment of all kinds. In Bali, the use of the miracle rice of the famed green revolution was not completely embraced because a single infestation could cause a common mode failure of all crops. In a complex world. where many of the side effects are unknown and unpredictable, diversity offers defense in depth. Safety engineers know the principle well. In the vernacular it is called it a belts - and-suspenders approach.

Social stratification contributes to social distress. Questions arise as to who can profit from the new technology and who can afford it. Those with a new potent technology clearly have a commercial and social advantage over those that do not. 'The elite have connections, power, money, influence and education and can take advantage of the opportunity. They are the advantaged minority. This may widen the gap between the haves and the have nots or reinforce existing social inequalities. This is not universally so and neither is just the cost of acquisition of the new technology , of itself, a barrier to its acquisition or an automatic cause of social stratification'[9.2.25]. It is recognized that the potential for stratification exists, although such a situation is not an inevitable outcome.

1.3.3 Importance of the Network

Technology transfer is a contact sport. This has been a mantra in the profession for years. It highlights the importance of personal contacts and face to face communication. According to Professor Bailey, the network is very important : 'the surest way to start the

transfer process is to find the network at the earliest opportunity, identifying a node and make personal contact as soon as possible'. Technology transfer literature from the marketing, communications and organizational behavior traditions point out the importance of the role of facilitators, change agents, linkers ( boundary spanners) , opinion leaders, gatekeepers, champions and angels. Creighton and Jolly's paper examines the role and qualities of an effective linker [9.1.3]. Cosmopolitan locals play a central role in international technology transfer. They are men and women who have 'seen the world' but who are also knowledgeable about the unique dynamics and culture of their organization.

1.3.4 Communication Difficulties

Communication is a recognized field of study, of which communication across cultures is a specialty. In a technology transfer context, the work done by organization behavior and social science researchers is very relevant . Section 9.7 lists many references that have helped in the understanding of the role of communications in technology transfer. 'Communication difficulties between the legal system and the scientific community as exemplified by the trial courts' rejection of empirical information is best explained by the profoundly differing understandings of causation. Law trained people tend to understand causation as deductive and operating in specific instances. In contrast, scientifically trained people tend to understand causation as operating not only deductively but also inductively and operative upon a field over a class of instances. The latter model of causality draws from a technologically more advanced notion of post-Newtonian science and statistical analysis. The discovery of quantum mechanics, particularly , forced science early in the

20th. century to develop this second understanding of causation. Modern computer technology facilitates the statistical analysis of probability. This modern mode of thinking about causation has created a body of statistical analysis that is commonly applied to science but not to law. To a scientist trained in the technology of statistical analysis, the element of chance exists in the empirical analysis of virtually all phenomena. To an empirical scientist, the observation that mere chance confuses the data does not end the analysis because it is precisely the analysis of chance that leads to the rejection or confirmation of the theory. The failure of the scientifically trained community to communicate effectively to law trained decision makers occurs in many areas of law that require statistical and inductive models of causality.

A second simple explanation lies in the observation that lawyers are not trained in modern inductive reasoning. Law schools provide very little training in social science methods. Social science findings describe the world as it is rather than how it ought to be. In contrast, the work of law is to provide access to justice' [9.4.1].

## SECTION 2
## THE ORGANIZING FRAMEWORK

If one approaches a specific technology transfer as a project, one can break it down into phases: a planning phase, an implementation phase, and an integration - review phase. For the purposes of this analysis and discussion of research, this is the approach that will be taken. A framework will be developed for the technology provider and the technology adopter. This tool is primarily for their use, but can be used by change agents, facilitators and assessors.

The terms technology provider and technology adopter will be used throughout the ensuing discussions. The terms provider is general- it could be the technology creator, developer, legal owner, facilitator, or agent. The word adopter conveys a sense of long term commitment to adaptation and integration on the part of the receiver. Once in a while, the word donor and receiver will be used for the old fashioned roles in the early days of technology transfer.

## 2.1 Cultural Assessment Matrix (CAM)

One comprehensive and systematic approach to assessing the interaction between an incoming technology and a host society and its culture is to create a matrix - a grid which has technology transfer attributes organized along vertical columns and cultural variables arranged along horizontal rows. This is called a Cultural Assessment Matrix (CAM). Please refer to figure 2.1. Each box or cell represents an interaction between a technology attribute and a cultural variables. These terms are further elaborated upon in following subsections.

## 2.2 Cultural Assessment Matrix Pair Sets (CAMPS)

In order to overcome pro-technology and donor biases, it is necessary for the technology adopter to be actively involved in the technology transfer process from beginning to end. Support from management on both sides for the process is a key factor for overall success.

The first order of business is to make sure that provider and adopter are familiar with the concepts of cultural assessment. Both parties should then agree upon the cultural variables and technology attributes that are pertinent to the situation. This is best done jointly. There has to be agreement as to dimensions of the matrix ( number of columns and rows) and the specific variables and attributes that are relevant. This is important , otherwise there will not be a defined boundary or a convergent process. It may take more than one iteration.

FIGURE 2.1. CULTURAL ASSESSMENT MATRIX

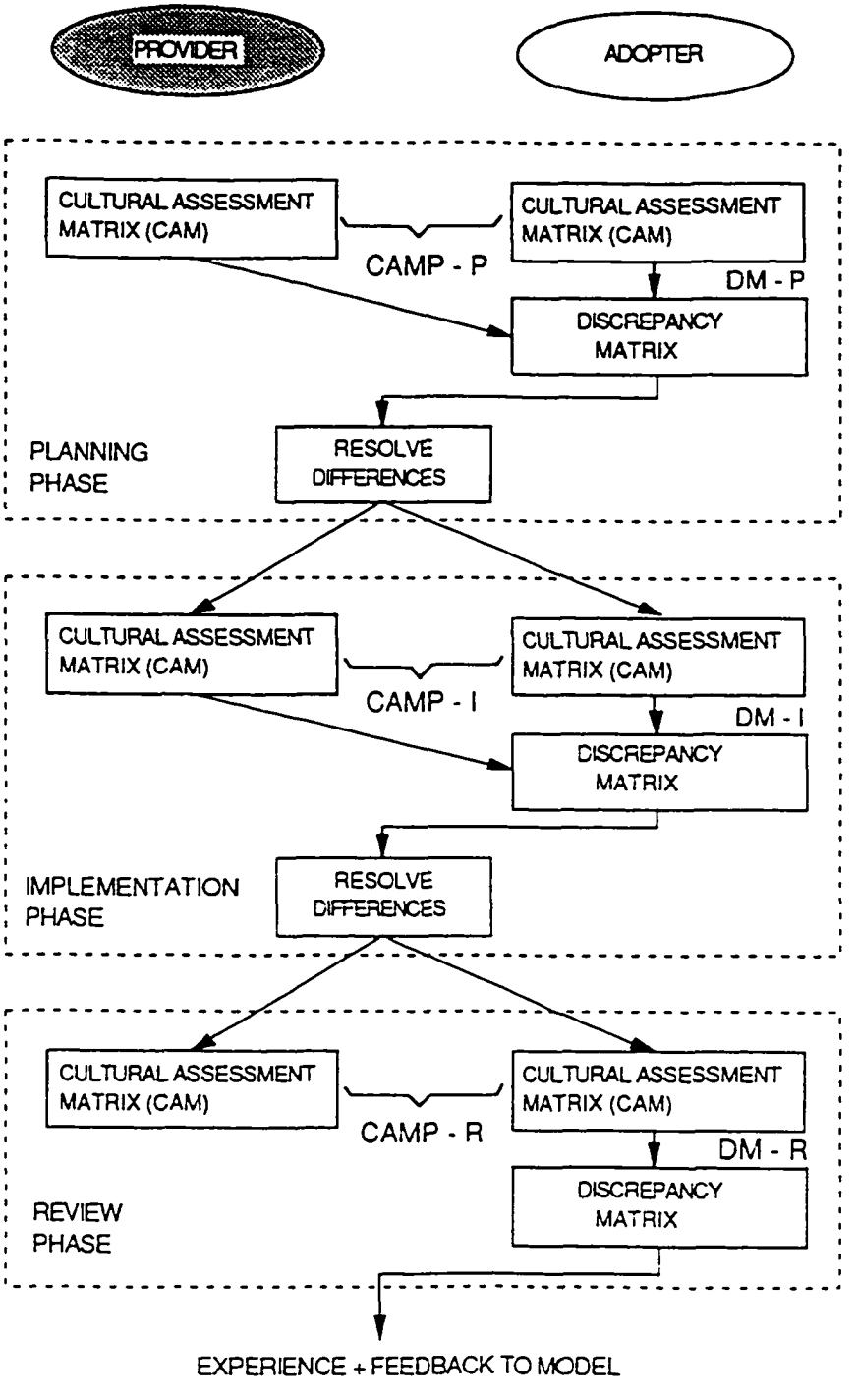



FIGURE 2.2 THE CAMPS PROCESS

Efforts during the approach to agreement are an investment in time that will pay for itself many times over in the overall process. Detailed discussion on these topics is contained in Section 3.1 .

Please refer to Figure 2.2 . A Cultural (compatibility) Assessment Matrix (CAM) is completed by the technology provider and an *independent* one is completed by the technology adopter. This is one Cultural Assessment Matrix Pair (CAMP) . One set is completed at the technology transfer planning stage( CAMP-P), one set during the implementation stage(CAMP-I) and one at the review/integration stage(CAMP-R). That is the essence of the framework and the process.

## 2.3 Matrix Rows and Columns

2.3.1 Cultural variables are organized into four broad horizontal overlapping categories that have a notion of increasing depth . Three categories: artifacts, values and basic assumptions, were proposed by Prof. Edgar Schein of MIT, a cultural ( and business) anthropologist in his book : Organizational Culture and Leadership. 'Artifacts are visible but often not decipherable. Values are tested by social consensus(espoused) and basic assumptions are deeply held, of long standing and taken for granted. Anthropologists have developed cultural maps which are not easy for businessmen to follow.

Culture does not reveal itself easily. Intuitive understanding can occasionally lead to oversimplification and outright misunderstanding. Unless one has searched for the pattern among underlying assumptions of a group and have attempted to identify the paradigm by which members of a group think about, feel about and judge situations and relationships, we cannot claim that we have understood a group's culture. It is very easy to assume that we understand and have an intuitive feel for what is going on, but unless we can clearly write out what we think we feel, we cannot tell whether we really understand and whether anyone else could understand' [9.4.2].

The proposed framework uses four levels of culture as distinct from the three levels used by Professor Schein. The artifact level is the same. The second level is called behavior- it is separated as a category for this research. Much of technology transfer work in business settings is tracked by observations in this category. The third level is called assumptions and the fourth level is called beliefs. Beliefs form the unarticulated subconscious core of a given society. They include religious and spiritual beliefs and are not normally discussed in business literature. Beliefs are mostly unquestioningly accepted within a society and no proof or arguments in their favor are usually offered or felt to be necessary, somewhat like the axioms of geometry - the shortest distance between two points is a straight line. Recall the Constitution : 'We hold these truths to be self evident....' Beliefs are non-negotiable. Individuals are often times not even consciously aware of them. If one were to

point out an example, the person would be puzzled as to the purpose. It is akin to telling someone " Do you know you are breathing?" or "Do you know you are speaking in prose?" When an incoming technology interacts in an adverse manner at this deep level, it starts an undercurrent of resentment, a negative response or resistance, the outward manifestation of which is very often non-specific, delayed and difficult to link with the incoming perturbation or perceived threat. The cause-effect relationship between the stimulus and the response is very difficult to establish. Emerging technologies, such as DNA manipulation, affect societies at this profound depth with increasing frequency and force. New technology is forcing societies to confront its values and belief systems. When technology is transferred to other societies, they are forced to do the same, but technology providers, in general, do not know what the value and belief systems of technology adopters are. It is risky to behave as though they are the same. They may not be, particularly in societies whose historical and social traditions are very different.

Judging another culture purely on the basis of one's own culture may lead to erroneous conclusions. It can distort understanding. Values range between the deeper levels of behavior through the assumptions level and part way down into the beliefs category. Table 1 is a starting list of cultural variables arranged in four categories. At the risk of frequent repetition, these categories are overlapping, and they have to be, because culture is not discontinuous. Distinct categories are a simplification in the model. The consequences of this are discussed in section 5. The reason that Table 1 is a starting list is because culture is so broad.

Culture, in general, includes music, dance, painting, sculpture, philosophy etc. Such attributes have been eliminated because their connection to technology transfer in tenuous. Variables that relate to technology transfer have been picked.

### 2.3.2 Technology transfer attributes

Technology transfer attributes are interpreted in their broadest sense. Included are the characteristics, capabilities and requirements of the technology provider and the technology adopter, the technology infrastructure, the environmental impact attributes, business attributes(including finance and marketing), law, politics and social impact attributes. Table 2 is a starting list of these attributes arranged by groups. Some of these groups have existed for some time. Environmental Impact Statements have been used as an instrument of public policy and citizen participation in the licensing and regulation of factories, refineries and power plants. Social impact assessments have been in use for a long time. The matrix framework integrates them. Groups are convenient ways of slicing parts of the overall assessment as vertical strips for specialized investigations. A special case is discussed in section 3.2- meaningful abbreviated assessments. This is not to suggest that these groups are non-porous or mutually exclusive. The matrix representation shown in figure 2.1 uses dotted lines ( in recognition of this relationship) for separating the groups and the cultural categories. Table 2 is labeled a starting list because technology transfer is so broad and is conducted in so many forums that a complete list is very difficult to create, a priori. That is not to suggest that the attributes list is deficient for an assessment. It is wider than the list of any other assessment approach, but the

organization is not as philosophically tight as the one for cultural variables. In fact, one of the topics of further research identified in Section 7 is a taxonomy for technology transfer attributes.

## 2.4 Characterizing the Interaction

At the intersection of each technology attribute and cultural variable, a 'cell' is formed to characterize the interaction .It is worth mentioning that one should not respond to short lived 'scintillation' such as knee-jerk reactions. One should look at interactions that are going to affect the process, not just any reaction at all. Each interaction or intersection becomes an 'element' or cell in the matrix. Each cell contains four sub-cells, each of which has a number: one for cultural reactivity, one for probability of interaction, one for cultural depth and the fourth for overall score or 'rating' which is calculated as a product of the previous three numbers.

Figure 2.3 is a graphical representation of the relationship that exists between the three sub-cell variables and the various levels of culture in the matrix formulation. It displays that reactivity , depth and probability are independent in the model.

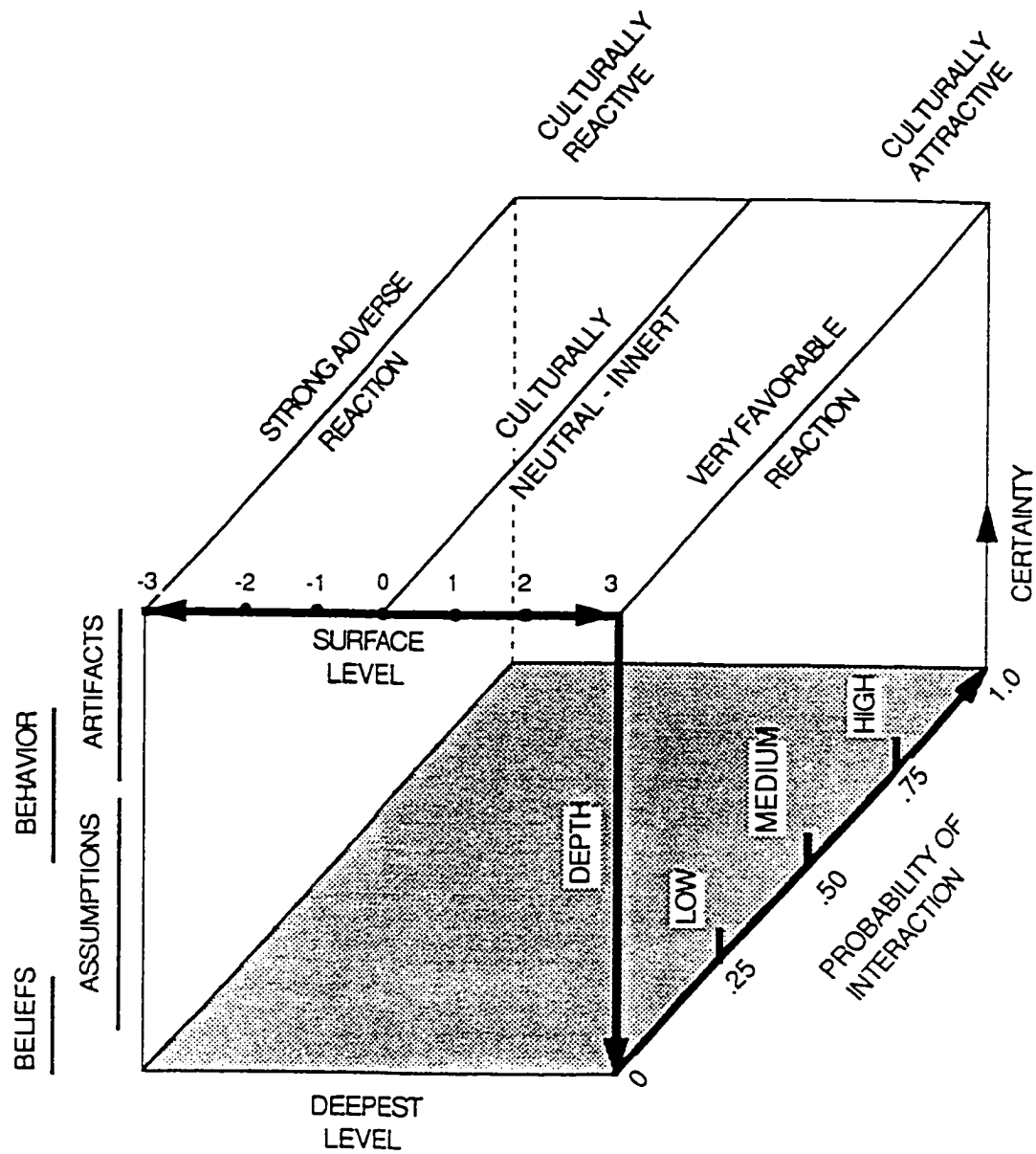



FIGURE 2.3 RELATIONSHIP BETWEEN CULTURAL REACTIVITY CULTURAL DEPTH AND PROBABILITY OF INTERACTION

If there is no interaction at the intersection, a zero is simply put in each of the four sub-cells. Zeros record that the intersection was not ignored or overlooked. Many, if not most, cells are expected to have zeros in them. After all, a given technology is not going to affect all depths of a culture in every aspect. The entire matrix is populated with cell scores; no cell is left blank.

The notion of *cultural reactivity* is an original one. If the reaction at an intersection is favorable or receptive, a positive score is assigned according to the following scheme: 1=mild, 2= moderate and 3=strong. For adverse reactions, a corresponding negative score is assigned. A rating of zero means that the product or process being introduced into society is *culturally inert* or *culturally neutral.* Let us take the example of the introduction of digital video disks in the US. It did not cause a cultural ripple. The product was a refinement of the laser disc. It would rate it zero in most cells. The introduction of a 'morning after' birth control pill was greeted with dismay in France and Italy a few years ago and would rate a -3 in some cells. Cellular phone introduction in the US a few years ago would rate +3 in many interactions. One should keep in mind the fact that the ratings are subjective and depend upon the technology, the host society and are valid for a period of time. Societies accept products today that would have not been acceptable to the

previous generation and vice versa. Culturally inert products may require a lot of effort to market but may integrate easily. *Culturally attractive* products ( a lot of +3 cell scores) are indicative of a strong market pull and easy integration. *Culturally reactive*( -3 cell scores) products indicate market rejection tendencies or technology push characteristics and painful integration. It does not mean that a few such scores are the signs of imminent demise, but a warning flag has been raised.

The concept of *probability of interaction* between a technology transfer attribute and a cultural variable is a modification of the principle of the probability of interaction between two persons described by the interaction matrix proposed by Prof. Robert Bailey of OSU in his paper ' The Development of a Practical Framework for International Technology Transfer' [9.1.12]. Rather than using a continuous probability density distribution function, a simple point scheme will be used: 0=no chance of interaction, 0.25= low probability of interaction, 0.5=medium probability of interaction, 0.75=high probability of interaction and 1=certain interaction. The assignments have the same caveats as those for cultural reactivity discussed earlier.

The notion of cultural depth was discussed earlier. Assignment of a numerical *weight corresponding to cultural depth* will now be proposed. The notion is that interactions at deeper levels are more significant to the transfer, implementation and integration process. Deeper interactions also can produce undesirable and unexpected side effects. The deeper

the level, the bigger the weighting. For the proposed framework, the following weighting factors will be used: 1 for artifacts, 2 for behavior, 3 for assumptions and 4 for beliefs. This is intuitive , but it raises many questions about the most appropriate relative weight factors for the four categories and spotlights gaps in our understanding of how to quantify culture for technology transfer. This is just one reason the dissertation is titled 'estimating the intangibles' and not something like 'calculating the cultural factors in technology transfer'. Section 7.6 recommends specific aspects that need further research. The overall score or 'rating' is a product (multiplication) of the three individual sub cell numbers. The product has the following arguments in its favor: Since only one factor has a possible negative score, the negative aspects will not be masked in the overall cell score. (This could happen if sums or weighted sums were chosen.) It tends to simplify the overall assessment. It makes sense in that if there is no reactivity or no probability of interaction, then we should get a zero score for the interaction.

## 2.5 The Representation Problem

Many cultural variables do not neatly fit into a given category level. They span them or aspects of them show up in different categories. Macro variables such as confidence and reciprocity are examples. Cultural variables cast a shadow on participant group attributes. Language proficiency is one such example. There are variables that are clusters of other variables . Examples are consumer confidence and work ethic. There are concepts and constructs that are a combination of cultural variable and technology transfer attributes. For instance, section 3.11 reviews recent research on intangible wealth due to internal

corporate structures. There are cultural variables that are not observable directly, but are inferred by reflections in behavior level variables-suspicion and doubt for examples. There are, what can be referred to as 'conjoint variables'- variables joined at the hip, like trust and sharing of information. 'Situational' variables such as the 'loss of face' that is so painful in many Asian societies is not as traumatic in the US. This is why personal bankruptcy is not the end of the road in the US. American society accepts failure as a possible outcome of venturing. Americans do not expect friends and relatives to collect money to pay off business debts. If it happens, that is over and beyond normal expectations. In Asia , bankruptcy also seems to imply that the individual has poor family and social backing. Recovery from bankruptcy is a long climb back into social acceptance.

Recognizing the nature of cultural variables is a step in the right direction. These 'complex variables' need to be resolved into their axes of cultural variable and technology attributes as best as one can. Up to now, all interactions have been lumped under the rubric of 'culture'. The purpose is not to dissect complex variables as one would a dead frog, but to study them living and make the best use of observations to help with the assessment.

If one took the point of view of a communications professional , one may argue that a technology transfer attribute group for communications is needed. The approach taken was to deconstruct the components of communications and put them in their appropriate place in the cultural categories . Variables in Table 1 have been aggregated in a useful

manner. They can be reassembled in a slightly different manner depending on the situation. That does not change the assessment, only the interim steps. Variables and attributes interact, are interdependent at times and sometimes modify each other. In that sense, the two dimensions of the matrix are not totally independent for all intersections. These situations have to be faced as they arise. Providing one leaves a trace of reasoning, one can revisit, revise and update the assessment in the light of better information and understanding. The CAMPS approach is conducive to assessment revision.

## 2.6 The Estimation Problem

There are two well recognized biases in technology transfer [9.1.11]. The first is called the pro-technology bias. It takes the position that technology is good at solving problems. If a technical solution exists, then one should use it. The second is called the donor bias that states that since the technology provider has used this technology to solve this particular problem, it will work for the adopter and, that the donor knows what is best for the recipient. In the fifties and sixties, when aid, not trade, drove the process, these biases were masked or tolerated. Under current market conditions, these biases stand out . Technology adopters are becoming more knowledgeable, secondary and tertiary effects are becoming better known and understood, regulations are proliferating and information is being so rapidly disseminated that these biases are becoming hindrances. More international technology transfer is taking place across cultures whose worldviews are different. The assessment by the technology provider may not be shared by the adopter.

## 2.7 Discrepancy Matrices

Please refer to Figure 2.2 . If the ratings of the provider matrix is significantly different from the adopter matrix, a Discrepancy Matrix(DM) is generated at the planning(DM-P), implementation(DM-I) and review(DM-R) stages. Each discrepancy matrix shows the differences in corresponding cell scores within a CAMP set. It is an early warning sign of differences in assessment between the technology provider and the technology adopter. The 'resolve differences' activity at the planning, implementation and review stages of the technology transfer process is essential . It is very important that the provider and donor are working on the same matrix formulation to keep the process on track. The discrepancy matrix should progressively have smaller cell ratings from the planning to the implementation to the review/integration stage, although the matrix dimension (rows and columns) will remain constant. That is the desired trend. It indicates a convergence of views, effective communication and sharing of objectives. If this is not occurring, then the process needs to be critically reexamined. *These discrepancy matrices are proposed as diagnostic tools and predictive indicators of a successful transfer.* Discrepancy matrices that are top heavy, i.e. have high cell ratings at the artifact level, indicate that the problems are on the surface and can be spotted relatively easily and that changes at the planning and early implementation stages will be beneficial. Discrepancy matrices that are middle heavy, i.e. have high cell ratings in the behavior level, indicate some implementation difficulties and a possible lack of acculturation that can be remedied by adapting the technology or by broader education and awareness- raising activities. Bottom- heavy discrepancy matrices

that have high cell ratings in the values and belief levels indicate probable long term integration problems and incompatibility issues either between the partners or in the cultures of the partners.

## 2.8 The Assessment Problem

'Pigeonholing what is really a continuous variable may produce misleading and erroneous conclusions. Statistics, whatever their mathematical sophistication and elegance, cannot make bad variables into good ones. The techniques are valid only to the extent that the data are meaningful for the problem at hand. One needs to be able to distinguish between dependent and independent variables. Detecting interaction, measuring partial association and specifying a relationship lie at the heart of multivariate analysis, whether of interval or nominal data. Social scientists can never prove causality or even the direction of causation, but they are willing to make various simplifying assumptions so that they can, at least, eliminate models that are inconsistent with the data' [9.8.21]. Analysis of nominal data helps us categorize it. Ordinal analysis helps order it to some specified criteria. Units are lacking but ordinal ranking permits comparisons at a conceptual level. It permits one to state which is higher in the preference scale but not by how much [9.8.17]. It has some value in prediction analysis and that is one basis for the organization of cultural variables [9.8.14, 15,18 19 and 20].

Several statistical aggregation methods were explored for the purpose of reducing the array of numbers generated by the cultural assessment matrices. Cluster analysis is a

technique that was investigated for looking at a matrix of data of recorded values of variables that are measurable and observable [9.8.12and 16]. The notion was that cluster analysis may help summarize the array of data that was generated by the CAMPS process.

Cluster analysis is non-parametric statistical analysis that is robust in the sense that it is independent of assumptions regarding the probability distribution of the data. If one has a defensible criteria -an objective function- then one can partition the data into clusters such that each data point within a cluster are more similar to other data points than those in another cluster. The idea is to minimize intra-cluster distance and maximize inter-cluster distance to coalesce clusters. In effect one partitions n-dimensional space, to some optimality criterion - an objective function. There are a host of objective functions , but for this research, this approach has rigorous requirements which cultural variables do not meet. Cultural variables are non-linear, time variant and of different weighting, depending on their context. The numbers in CAMPS matrices are not measurable in a scientific, objective sense. An important item in solving a cluster problem is determining the number of clusters desired in the solution. Determining the number of clusters is a difficult problem [9.8.13]. There is no definite number of clusters or size/shape of clusters, so that even statistical pattern recognition techniques do not help us very much. In pattern recognition, one needs a clearly defined set of patterns that are 'recognized' and generally agreed upon, a priori among peer experts. There is no such databank or history of past evaluations that have been independently validated, and have not therefore, used this technique to come up with a scalar overall score for technology transfer success.

The concept behind principal component analysis is that a small percentage of the data can be identified that can explain most of the results[9.8.18 and 19]. In every day conversation , expressions such as '20% of the data provides 80% of the value' are used. This notion again does not fit the ratings of CAMPS matrices. The nature and degree of differences between cultural variables at various levels precludes this approach to significance testing.

Table 1 shows examples of conceptual linkages between variables. There is no measure of association or numerical index summarizing the linkage. The reasons have been mentioned earlier. The linkages themselves, however, are quite useful in cultural assessments since they allow better assignment of sub-cell scores because they provide some insight as to the relationships between cultural variables.

2.9 Confidence in the model.

Verification and validation of the scores in CAMPS matrices will come about by experience that will come with repeated actual usage over time in many locations under different conditions. In order to give the model intellectual validation, many experienced people in the technology transfer field or in the automotive industry in the US, Singapore and Indonesia were contacted and discussions held with them on various aspects of the CAMPS model and its underpinnings. Their insights were helpful in the development of Table 1 and 2 and the discussion papers in section3. Table 3 is a list of people who were

generous in sharing their time and knowledge and contributed to the intellectual development of the framework. Table 4 is a list of conferences that were attended to seek more verification and insights from experienced professionals who were in attendance. This validation is not an anthropology style cultural immersion in the field, nor is it a marketing type survey questionnaire method. This is an intellectual framework or model being readied for use; it has had extensive review by some of the best minds in the business. It is ready for beta trials.

(Cultural Variables Organized by Category/Depth. Vertical Axis of Cultural Compatibility Matrix. Reality is more complex than the representation; the variables have a depth range. As a result, the categories are overlapping and form a continuum.)

**Artifact Level:**

*Product level preferences*: sensitivity to purchase price, maintenance and repair costs, aversion to product obsolescence, product cycle duration, preferences as to color, shape and size, language requirement for use, icons ( visual as opposed to textual information), ease with complexity, preference for 'smart' technology, man-machine interface, expectations of reliability and durability, requirement for availability of service/repair, life extension

*Utility level preferences*: convenience, time saving or shifting, comfort ( provides comfort- prevents pain), boredom and drudgery reduction, space saving, helps artifacts stay organized, information management, environment protection, enhances personal security or those of possessions.

Symbols

**Table 1 : Starting List of Cultural Variables**

(Continued)

**Table 1 (Continued ) : Starting List of Cultural Variables**

**Behavior Level:**

Willingness to change (attitude, mindset), Ability to change ( flexibility), acceptance of new products, processes and ideas. #2

Risk profile: willingness to take physical risk, intellectual risk, financial risk;

Social acceptance of failure

Independence, individual versus group ; individual responsibility and accountability, competitiveness, self confidence. Expressiveness( articulation), assertiveness ( boundary with aggressiveness)

Family or social good and harmony over individual fulfillment, sacrifice #1

Communication style: direct versus indirect/oblique, openness, directness, informality, deference

Confidentiality, discretion, trust

Negotiating style

Realism versus denial, living in the past, present or future

Tendency towards organization/discipline versus chaos: queues, traffic, crowds etc.

Waste minimization, environmental protection

Personal and public hygiene

**Table 1 : Starting List of Cultural Variables**

(Continued)

**Table 1 Continued : Starting List of Cultural Variables**

Courtesy/manners, noise level, privacy

Respect for law, compliance #3

'Face', honor and guilt #1

Decision making process: autocratic or consensual, individual vs. group, speed vs. accuracy.

Respect for elders and teachers, loyalty between friends and equals, responsibility for children.

Tolerance of other racial groups, languages, customs, comfort level in heterogeneous groups

**(Shared ) Assumptions Level:**

Definition of family: core/nuclear or extended, individual's place in the family, personal identity, kinship, social obligations #1

Patience, tolerance and forgiveness

Esteem for education

Respect for and awe of tradition

**Table 1 : Starting List of Cultural Variables**

**(Continued )**

**Table 1 Continued: Starting List of Cultural Variables**

Optimum level of personal freedom, respect for and reaction to authority

Fair play, openness, hidden agendas, trust,

Perception of corruption

Freedom of information, transparency, level playing field

Homogeneity/diversity, secularism, suspicion of 'outsiders' #2

Concept of space, its organization-its availability, privacy

Concept of time, its 'uses', leisure, recreation, sports

Gender roles

Size and role of government, social programs, entitlements, fair and timely justice, access to health care, protection of minorities and disadvantaged citizens, equitable distribution of wealth- taxes #3

Purpose of law, its basis, its role in modifying social behavior, social reform vs. punishment, separation of functions between executive and judicial arms #3

Separation of religion from state

Environmental stewardship harmony or dominion over nature

Taboos: food, marriages, transactions, travel methods/times

Definition of life and death, transfusions, organ transplants

Life after death: burial versus cremation, mortal remains, ancestors

**Table 1 : Starting List of Cultural Variables**

(Continued)

**Table 1 Continued : Starting List of Cultural Variables**

**Beliefs Level:**

*Technology*: Limits within which humans should operate: tinkering with nature: DNA manipulation, genetic engineering, cloning

*Medicine:* Holistic model of humans, wellness, body-mind interaction, alternative medical systems ( allopathic, homeopathic, ayurvedic, Chinese accupuncture, Islamic hakim, local herbal knowledge), alternative exercise systems ( Yoga, Tai-chi, traditional western, Asian martial arts etc.)

*Metaphysics:* origins of the universe, its evolution, other forms of life in the universe

*Religion:* God, nature, purpose of creation, role of humans- position in creation relative to the rest of creation,, good/evil, sin, guidelines for human social conduct, life after death, scriptures, exclusivity, moral-righteousness, rebirth-release, heaven-hell.

*Spirituality:* Awareness, consciousness, belief in a supreme being and attributes, God's presence, unity in creation, ultimate truth .

*Misconceptions*: racism, devil worship, voodoo, religious cults

*Pseudo-sciences and superstitions*: astrology, palmistry, feng-shui ( Chinese geomancy). omens, talismans, curses/hexes, potions, mediums, crystal balls.

**Table 1: Starting List of Cultural Variables**

(# These variables are conceptually linked. The linkage number shows the affiliation. e.g. all #1 variables are associated.)

Technology Transfer Attributes

Participants Group +: + indicates that it is a part of the abbreviated assessment

*Provider characteristics*

Motivation , strategy and agendas

Empathy (shared objectives with adopter), watchful of judgmental attitude and snap assessments

Time horizon

Previous technology transfer experience: in general, in the country/region, with this adopter

Capability: Originator or facilitator of technology

Extent of legal rights to technology

Language proficiency in native language of adopter

Organizational behavior topics: age, size(persons, units, locations, facilities), structure( official, unofficial, power structure), formality etc.

Local knowledge and orientation - awareness of specific technical nuances, local traditions and subtle local technical practices.

Propensity to take risks

**Table 2 : Starting List of Technology Transfer Attributes by Group**

(Continued)

**Table 2 Continued: Starting List of Technology Transfer Attributes by Group**

*Adopter characteristics*

All the above factors, plus the following:

Value of new technology in overall company strategy

Technical sophistication of new technology relative to current capability: incremental or radical

Language proficiency in native language of provider

Technology Related Group +:

education and training upgrading: professionals, skilled labor (individual & organized)

industrial capability and capacity, supporting related technology : identification, testing, quality assurance, quality control

Infrastructure Group +:

transportation: automobile, trains, shipping, air

communications: mail, phone, fax, newspapers, satellite TV

site access: airline connections, frequency/ safety, road system

utilities: water, energy ( gas, electric), gasoline/diesel availability, waste disposal, serviced land , factory and office space

**Table 2 : Starting List of Technology Transfer Attributes by Group** (Continued)

**Table 2 Continued: Starting List of Technology Transfer Attributes by Group**

Environmental Impact Group +:

air and water quality

land use issues

public health issues; hazardous materials, radiation, non-degradable waste

biodiversity reduction*

The above groups marked + constitute the Meaningful Abbreviated Assessment( MAA)

*biodiversity reduction is an exception and is excluded from the MAA.

Business Group:

banking: services, credit, commercial intelligence

insurance services

finance: services, stock/bond market, trading, secondary markets, capital formation and placement, _currency stability, liquidity, convertibility, inflation

accounting risk, availability of timely information, factual reporting, disclosure

auditable standard accounting practices

non-discriminatory taxation

**Table 2: Starting List of Technology Transfer Attributes by Group**

(Continued)

**Table 2 Continued: Starting List of Technology Transfer Attributes by Group**

Legal Group:

fair and timely justice, protection of commercial and private assets and person

trade agreements,

tariffs and non-tariff barriers,

choice of language and forum

choice of law

intellectual property protection, trade secrets, know-how

export/import controls

labor disputes and settlements: mediation, arbitration, strikes, lockouts

corporate ownership rules and local representation requirements

enforcement of international judgments and awards

alignment to World Trade Organization practices

Foreign Corrupt Practices Act.

Political Group:

ideology, alignment of provider and adopter nations

stability of adopter nation

dual use technologies, national security of provider or adopter nation

**Table 2: Starting List of Technology Transfer Attributes by Group**

(Continued)

**Table 2 Continued: Starting List of Technology Transfer Attributes by Group**

technology as a showcase- national aspirations and prestige of adopter nation,

organized labor sentiments and history of adopter nation

level of government "participation' in day to day decisions and operations

subsidies, tax breaks, incentives

Social Impact Group:

*(adopter society)*

increased unemployment and retraining requirements

relocation, displacement, rehabilitation, disruption, family breakdowns

social stratification: increasing gap between haves and have-nots

indigenous knowledge reduction.

*(provider)*

quality of life of provider expatriates at adopter location

**Table 2: Starting List of Technology Transfer Attributes by Group**

1. Mr. Toshikata Amino*, retired Executive Vice-President of Honda of America, Executive in Residence- Fisher School of Business, The Ohio State University, and Director and Chief Consultant, Cross Cultural Management Institute, Plain City, Ohio
2. Dr. F. Timothy Janis, President, ARAC Inc., specialists in technology transfer, Franklin Indiana.
3. Mr. D. Ramesh Kumar, Director*, Joint Ventures, Texmaco, Jakarta, Indonesia,
4. Mr. Jorn Lillelund* President and Director, Danapaints Indonesia, Jakarta
5. Ms. Iynee Low, Head Technology Management Centre, Productivity Standards Board, Singapore
6. Dr. Poh Kam Wong, Director, Centre for Management of Technology, National University of Singapore
7. Dr. Jasbir Singh Dhaliwal, Centre for Management of Technology, National University of Singapore
8. Mr. Lawrence Chew, Managing Director, Meritor Heavy Vehicles Systems, Singapore

* Interview Notes for these are contained in section 8

**Table 3: Significant Contributors to the CAMPS Approach**

1. Technology Transfer Society Annual Conference, 1996, Cleveland , Ohio
2. Technology Transfer Society Annual Conference, 1997, Denver, Colorado
3. The University of Michigan, South East Asia Business Program, Conference : The Automotive Industry in Asia, October 6/7, 1997.
4. Conference on Knowledge Creation Management in Asia, 6/7 March 1998, The National University. Singapore.
5. Ohio International Trade Conference, Columbus, Ohio, November 1996
6. US-Korea Investment and Technology Conference, Chicago, October 1996.

**Table 4: List of Conferences Attended**

# SECTION 3
# SELECT ISSUES AND CONCEPTS IMPORTANT TO THE CAMPS APPROACH FOR US-ASIA TECHNOLOGY TRANSFER

## 3.0 Diversity Within This Section and its Organization

The study of the influence of the respective cultures of the technology provider and the technology adopter is a vast subject. The topics are chosen with an intent to broaden the base of understanding of cultural assessment by technology transfer professionals and are expected to contribute to fostering cultural empathy in the technology provider and technology appreciation and trust in the technology adopter. Efforts have been made to cull those issues and concepts that are likely to enhance the capability of the participants for the CAMPS approach. The organization of this wide range of diverse and seemingly unrelated subjects poses a challenge; the approach taken has been to group the issues by fields of study. There are several reasons for this: (1) by and large, universities teach, research and publish by recognized disciplines (2) it is consistent with the rest of this dissertation, including the organization of references and bibliography (Section 9), and (3) this format lends itself to logical extension to further research areas discussed further in section 7.

The various sub-sections that follow are intentionally modular; their full value is derived, however, when they are linked together- as an anthology. Since the CAMPS process starts with matrix formulation, it naturally follows that this aspect be discussed first.

Because US- SE Asia technology transfer was the validating field of study for the framework, the insights gained are related mostly to Asian culture. Comparing US and Japanese approaches to transferring technology is instructive because technology adopters may need to be made aware of the differences in outlook, particularly where their previous experiences have been primarily with Japanese companies. U S technology providers benefit by a clearer appreciation of technology adopter expectations.

Legal issues are reviewed in a general international context. Subsequently, the legal landscape of Indonesia is presented as a country case study, to demonstrate the level of background research that is appropriate for a full cultural assessment of a substantial technology transfer project.

In the business sub-sections, current Swedish research on the assessment of the worth of intangible assets of a business is included because their findings have conceptual ties to commercial assessment of technology that are useful to the technology transfer process in the overall context of technology management.

The anthropology sub-sections contain topics that are not traditional in technology transfer literature and are, in the researcher's experience, underrepresented and understated. The subject of corruption, for instance, is not well researched - the reasons for this are presented.

As our understanding grows with time and with research on South America, Africa and Australia, this list of select important topics will undoubtedly grow. Another aspect of this section needs to be pointed out. The language used in the sub-sections uses words in their technical sense within the discipline. This is necessary for precision in expression and academic rigor. An example is the use of the term 'artifact level' in the classification of culture; this term has a heritage of organizational behavior research over the past twenty years at the Massachusetts Institute of Technology by Dr. Edgar Schein and others. There are similar concepts from the various disciplines that have contributed to the development of this dissertation. Care has been exercised so that the language does not get unduly esoteric. The reader, however, is urged to take a holistic inter-disciplinary perspective and not begrudge the fact that the vocabulary of a single discipline was not exclusively used in this section. This would have detracted from the deriving the full benefit from the development and may even have led to conceptual difficulties. The difficulty this poses to the reader is primarily the result of the multivariate and interdisciplinary nature of technology transfer.

## Section 3.1: Formulating the Cultural Assessment Matrix for Building Early Consensus in the Process

The entire CAMPS process is predicated on the understanding that the participants chosen by the technology provider and the technology adopter are generalists, good communicators, open minded, in favor of the transfer, harbor no hidden agendas and are supported by their respective management. If, in spite of these intentions, it turns out that an impasse is sensed , then established disagreement resolution methods should be resorted to before the situation veers towards a conflict or confrontation; that would be ironic, since this process has been expressly designed to facilitate and guide true dialog and to preclude misunderstandings from becoming irreconcilable differences.

### 3.1.1 Choosing Technology Transfer Attributes

Planning for technology transfer should be initiated as soon as the nature and extent of technology transfer and the principal players are identified. To start the CAMPS approach, the dimensions of the cultural assessment matrix( the technology attributes and cultural variables) need to be agreed upon by both parties.

In general, the technology provider has a better understanding of the nature of the technology and therefore should be deferred to in the event that there is disagreement on the selection of a particular technology attribute. The CAMPS approach has built in correction for donor bias; the initiative taken by the technology provider in the finalization of the technology attribute set will not swamp the process. Table 2 represents a starting list of technology transfer attributes and should be referred to during the ensuing discussions.

As a means of getting started, the technology provider and the technology adopter should discuss the nature of the assessment, its duration and scope and the background of the participants. The persons completing the CAMPS matrices can conceivable become major players in the technology transfer process. General agreement about which groups of attributes will be included can go a long way towards eventual consensus.

The participants group attributes may at first sight seem like cultural variables, but they are really not. What is being assessed, among other things, is the technical capability of the provider and previous technology transfer experience. The concept of 'cultural asset inventory' is useful at this stage.

The technology provider and the technology adopter should survey their respective organizations to identify individuals who have prior experience with the other culture. (This may be because of the individual's heritage, personal travel, work assignment or family connections). Comparing the cultural asset inventory of the two parties can help identify capabilities that may prove beneficial to the technology transfer.

The motivation and time horizon being examined are those of the technology provider company, not that of the individuals participating in the technology transfer. Discussion of these attributes will create better understanding of the capability and expectations of both sides. The adopter side has a few extra variables (adopter characteristics) that should be included in the formulation. The technology provider puts zeros in these matrix cells when it comes to scoring these The dimensions and variables need to be the same in the CAMPS matrices of the provider and adopter; otherwise discrepancy matrices cannot be created and the process will stall.

There are several must-have technology attribute groups (a) participants, (b) technology related, ( c) infrastructure and (d) environmental impact. These are discussed in section 3.2: Meaningful Abbreviated Assessments. All the attributes within the above groups should be included with the exception of biodiversity reduction in the environmental impact group. The infrastructure group attributes were, in all probability, part of the business planning prior to the contract, but it is recommended that they be more closely examined from a technology transfer perspective.

The other attribute groups (business, legal, political and social impact) are necessary for a comprehensive cultural assessment. The differences in the variables in the social impact group between provider and adopter should be handled the same way as outlined above for the participants group.

When reviewing environmental impact attributes, technology providers have special responsibility to point out the international standards that they are held to. These may be more stringent than the local norms. The public relation aspects of this at the provider's country of origin has to be considered in addition to the rules that apply at the adopter location. This recommendation also applies to labor and safety practices.

Interdisciplinary competence is at the heart of the CAMPS process . It is likely that the business and legal group attributes may need a special team member. If such a person is not dedicated or assigned to the task, then, as a minimum, that expertise should be applied by consultation. Most companies do not want persons other than trained lawyers assessing legal issues. The CAMPS approach is not a legal study or interpretation, but rather an awareness of legal interaction. Participation by a lawyer on an as-needed basis may be the most cost effective solution .

Emotions may run high when political attributes such as political stability etc. are discussed. One tactful way of discussing the topic is to discuss the duration of the transfer, the next election, if there is going to be one, and some policy changes that may impinge on the transfer being planned.

The social impact group is where the adopter has to be candid, if true benefit has to be derived from the cultural analysis. Human resource professionals, business anthropologists and marketing persons are very useful sources of knowledge in this area.
The quality of life of expatriates and their families is very important and here, the adopter can make all the difference in their understanding of the problems. It is not just a matter of money. Empathy and a warm reception can make all the difference [9.4.23].

### 3.1.2 Choosing Cultural Variables

Section 2.2 discussed the nature of cultural variables and Table 1 presented a starting list from which one could choose. Section 2.8 pointed out the assumptions that were made and the difficulties of assessment and interpretation. Section 5 gives us the limitations of this approach.

The CAMPS approach has an inherent built in correction for pro -technology and donor bias by having the provider and the adopter fill out their matrix independently. There is

still the need to have the same dimensions ( rows and columns)and the same variables in the matrix. One process by which both sides can reach an understanding, follows.
The nature of the technology and the selection of technology attributes discussed earlier will clearly guide the selection of the artifact level variables. This level is very closely coupled to the technology chosen for transfer.

Selection of behavior level cultural variables can lead to value-laden discussions. One way to keep discussions impersonal it to initially rate each variable as irrelevant, peripheral or relevant. This will help narrow down the differences. Later, the provider and adopter can start characterizing the interaction by assigning cell scores.

It should be observed that many variables require discussion as to their meaning. That is part of the process of each party exploring their own culture as well as the culture of other party. Discussion will open up communications, and help foster understanding and empathy. For instance, let us consider the variable- 'gender roles'. The discussions could initially start about the workplace: the specific positions held by women and men in the two organizations and the personnel policies relating to them. One could then discuss the sensitivity of men reporting to women and vice versa. The variable - family welfare over individual welfare- can be couched in terms of possible relocation or transfers out of town and the likelihood of acceptance. The role of working spouses and elderly live-in parents may come up quite naturally.

The topic of hierarchy and respect for authority can be introduced via discussions about eating facilities, number and category of locations and how this is arranged and whether a change is necessary or possible.

Once the initial round of discussions is over, the behavior variables felt to be irrelevant should be discarded. The ones that are marked peripheral should be discussed further till they become relevant or not; the latter are then discarded. This iterative approach will result in set of variables for the behavior category.

Shared assumptions are probably best handled by each side putting on the table what they see as important from their own point of view. For the beliefs level, it is the other way around; each side should put down those variables that would be important to the other side. Then notes should be compared. At the planning stage, if serious disagreement is observed in finalizing a common set, then the technology provider should acquiesce to the judgement of the technology adopter because the host culture is the one that will determine successful integration and sustainability. The provider should take careful note and revisit the matrix at the implementation stage. By this time, the adopter should have developed a better feel for the incoming technology and the provider's culture. It should not be considered a failure if the assumptions and beliefs levels are thinly populated at the planning stage since this kind of analysis is probably a novel experience for the technology provider and the technology adopter.

The fact that they are consciously trying to surface and anticipate any cultural side effects from the technology transfer is, in itself, of long term value for both sides. It would not be at all surprising if these levels start to become more populated at the integration-review phase.

How can one ensure that significant variables have not been missed? There is no absolute way to ensure that. A very good insurance against it is to become familiar with a cultural database that has been in development for decades called the Human Relations Area Files (HRAF). The prime mover behind the concept is George Peter Murdock of Yale University's Institute of Human Relations. There are two organizing principles embodied in two books. The first, 'Outline of World Cultures'(OWC) [9.2.49] which is organized into 310 cultural files, each of which contains indexed and descriptive information on a culture or closely related group of cultures. This information is keyed to the second book or database called 'Outline of Cultural Materials' (OCM) [9.2.6]. This comprehensive subject classification of over 700 subject areas grouped into 79 major topical sections ( numbered 10-88), each of which has up to nine minor subsections numbered 1 to 9.

Although compiled by professional anthropologists as a tool for cross cultural work, the system can be used by other professionals with a certain amount of training. It covers many aspects of human behavior. HRAF files are available at most major universities in microfiche form. One significant limitation of HRAF files is the time lag; they are updated

every few years. Current research may not make it to the files in time. The following are subject categories selected for their relevance to technology transfer work:

Section 47 - cooperation/competition

Section 57-interpersonal relations ( 1-social relations/groups, 2-friendships, 3-cliques, 4-visiting/hospitality, 5-fraternities/clubs,6-etiquette,7-ethics, 8-ingroup/antagonisms)

Section59-family

Section 176-innovation, 181-ethos, 184-cultural participation, 426-patents/copyrights.

Many sections and subsections are cross referenced to each other, lending verification to the concept of the cultural variable linkage embodied in Table 1.

Agreement on cultural variables by the technology provider and the technology adopter is a big step in cultural compatibility assessment because presently such assessments are rarely done, and when done, are not conducted with rigor or systematic method.

## Section 3. 2: Performing a Meaningful Abbreviated Assessment (MAA)

1. Rationale

In real life situations, time, relevant good information and money frequently limit the good intentions of technology providers and facilitators. Experienced professionals are scarce and it is often times not possible to assemble cross functional teams to perform comprehensive and holistic assessments described in this dissertation as the CAMPS process. This discussion offers a smaller systematic framework for smaller and shorter lived technology transfer activities.

The recommended approach is to examine (a) the characteristics of participants and their organizations engaged in the technology transfer process ; (b) the technology related and the educational /training requirements at the host location; (c) infrastructure requirements and (d) the potential impact on the environment at the host location. We will focus on parts (a) and (b) in this paper because they are often overlooked . { Note: We have not included biodiversity in the environmental group in abbreviated assessment, but it is very much a part of the comprehensive CAMPS process.}

Businesses are very familiar with establishing the infrastructure requirements. Many companies adopting a new technology, the local population affected and their regulatory bodies are increasingly monitoring the environment.

The technology attributes of the infrastructure group, and the environmental group contained in Table 2 are repeated here for ready reference :

Infrastructure Group:

transportation: automobile, trains, shipping, air

communications: mail, phone, fax, newspapers, satellite TV

site access: airline connections, frequency/ safety, road system

utilities: water, energy ( gas, electric), gasoline/diesel availability,

waste disposal, serviced land , factory and office space

Environmental Impact Group:

air and water quality

land use issues

public health issues; hazardous materials, radiation, non-degradable

Table 2 indicates technology attribute groups included in an abbreviated assessment by a + sign in the group heading. Figure 2.1 also indicates the portion of the full CAMPS assessment that constitutes an abbreviated assessment.

MAA is concerned with the *planning, preparation and execution of the technology transfer*. It does not look in depth into the society of the adopter and it is , for that reason, referred to as an abbreviated assessment. The CAMPS approach looks not only at all the attributes covered by an MAA but also the business, legal, political and social attribute groups; such a comprehensive approach also addresses issues germane to technology integration and sustainability at its new location. Table 2 (A starting list of the attributes by groups) provides details of all groups; MAA covers participants, technology related, infrastructure and environment. Part (a) covers the first two groups and part (b) the last two groups.

2. Participants Group

2.1 *Organization behavior topics*. Section 3.9 examines the motivations of both the technology provider and the technology adopter, their strategy agendas and time horizons as well as the organizational behavior issues of size, age, management styles, power structure etc. There are variations depending on business arrangements in general and the contractual arrangements in particular, be they direct foreign investment or licensing as distinct from joint ventures. Professor Reisman's paper " A Taxonomy of Motivations for the Transfer of Technology" [9.1.19] offers a complete treatment.

2.2 *Empathy* in the provider is manifestation of a combination of several personal qualities. It means that the provider shares the adopter's objectives and is willing to work with him or her to make the transfer work. Empathy means that the provider does not

look down at the provider either in disdain or condescension. It also implies that the provider is not ready to make a snap judgment of the provider before he or she has "walked in the other person's moccasins". Empathy generates patience, tolerance and an understanding that tides the process over the rough spots.

2.3 *Capability* of the tech transfer contact persons is crucial to success. The desirable qualities of tech transfer agents and facilitators are numerous : ability to communicate across disciplines and cultures and proficiency in the native language of the other partner are some of them. Willingness to go the extra mile, work outside the box, do whatever it takes are winning qualities. Technical competence in the area of transfer is always an asset. In some cases, such as when highly specialized knowledge or skills are transferred, technical competence is a must. Much depends on the adopter as well as on the technology. One should not forget that if the technology provider is the originator of the technology, then he or she may have 'deep knowledge' of the product, process and capability that this will add an extra dimension to the confidence that the transfer will succeed.

2.4 *Previous technology transfer experience* is very valuable. If the provider has experience with the host culture or subculture, so much the better. If he or she can, not only survive in it but enjoy the culture, then the project will take on the nature of a challenge rather than a chore. The provider's previous experience and demonstrated ability can be of value.

2.5 *Language* is important enough to be singled out as a special topic. Even casual tourists experience the power of language in communication. Linguists and philologists know that language is inextricably linked to thought, emotions and values systems. The language requirement goes both ways. The technology provider needs to know the adopter language so that the ideas can be communicated. The adopter should know the language in which the technology was developed. Many concepts are embedded in a language. Subtleties do not translate well. This is true not only in literature ( especially poetry) , but also in business and technology. Jargon is used within groups to speed communications , but it also creates insiders and outsiders. In a tribal sense, it is a badge of belonging. Knowledge of the language shows respect for the other culture and helps overcome deficiencies in other cultural areas.

2.6 *Extent of legal rights.* Section 3.7 and 3.8 cover legal aspects of technology transfer analyze issues in some depth. Contracts do not often establish the extent of legal rights to the technology held by the provider and the extent of legal ownership that will end up with the adopter. Expectations are rarely explicitly discussed at the beginning. Both parties need to be aware that misunderstandings are easy in this area.

2.7 *Local knowledge and indigenous knowledge*. Experienced technology transfer agents are keen and active listeners. They know that the technology adopter has a much more intimate knowledge of local materials, subtle technical skills and practices that can have a

significant impact on the application of the technology. By learning from the adopter, the provider can make allowances and corrections to the product or process for local conditions. The Japanese are masters at supplier integration. Companies who seek rapid growth will have to learn from their customers and manage the demand chain, not just the supply chain [ 9.3.1].

2.8 Technology transfer has its *risks*. Many unsuccessful efforts have been made since WWII, hence the serious study of the subject. Providers of technology should be prepared to take risks and accept *temporary failures* along the route. This profession is not for those with a feeble heart or will.

2.9 *Value of new technology* . If the technology adopter is not pursuing new technology as an integral part of the company's business strategy, then chances are the transfer will not yield its full potential. This is because it will not have the support of top management, the best persons will not be assigned, sufficient resources will not be applied and the adopter staff will go through the motions for the sake of appearances.

2.10 *Rate of change*. Change is difficult, change is painful, change is inevitable. We have all heard this in our professional careers. However, the size of the technical step in a technology transfer is very important. Although technology is moving at a dizzying pace, catching up with someone else takes effort and time. Relative velocity is

important ( the concept of downfield tackling in football was pointed out to me). Both provider and adopter should take notice of just far and how quickly one can introduce new technology. Is it an incremental or radical change in technology? Will much be rendered obsolete? These factors need to be considered.

3. Technology Related

3.1 *Education and training* for the new technology. Families prepare for a new addition to the family, gardeners prepare for a new tree or shrub ; technology adopters have to do the same in their organizations. In addition to the placement of and training for new machinery and software, training is necessary for the change in thinking and processes. The more innovative, culturally deep or revolutionary the technology ( as opposed to evolutionary), the more subtle and well thought out has to be the preparation. In addition to specific training, education may be required. For companies whose mainstream business is non-technical, more effort may be required; a Limited or Huntington Bank may need more effort than a 3M or Motorola.

The required skills training of technicians and craftsmen should not be overlooked. Management needs to have a working familiarity and appreciation of the technology that is the subject of transfer.

3.2 *Industrial capability and capacity*. Although a Meaningful Abbreviated Assessment is looking at the adopter rather than the host society, the new technology may introduce new build versus buy decisions, the increased productivity or scale may require a careful review of both in-house and supplier chain capability.

3.3 *Supporting related technology*. Very few companies are totally vertically integrated. At the time of introduction of a new technology, change managers should look around and determine if corresponding changes are called for in support functions both inside and outside the company. Needs analysis of supporting technology should include quality assurance, quality control and other technical audit functions. A meaningful abbreviated assessment is a 'classical' tech transfer analysis with new dimensions added to it. It is however, linked to the new comprehensive CAMPS approach. In a MAA quantitative techniques such as cell scores for cultural reactivity, cultural depth and probability of interaction are not required. Qualitative notes are sufficient. All the work that is put into an abbreviated assessment can be built upon to grow it into a full CAMPS assessment should one be deemed necessary later. It is not being suggested that a MAA precede every CAMPS assessment. There is little duplication; the methods are compatible.

## Section 3.3 : Know How, Know Why and Show How

The word know-how is loosely used in the media. It is often used interchangeably with technology in a low tech sense. The expression ' good old fashioned American know how' has built into it a sense of practicality , common sense, uniqueness and skill. The technology transfer profession uses know how in a more precise way. In this research , it is defined as 'the application-specific set of knowledge, experience and skills that make a particular technology effective or efficient in a given situation and location'. The legal definition of know how and its implications are discussed in section 3.7

When abstract subjects such as the nature of knowledge are studied, one becomes increasingly aware of the subtle differences in the intellectual understanding process. Graduate students are accustomed to asking the question 'why'. It is this driving curiosity, this thirst for knowledge and understanding that drives research. Each answer raises more questions and the process continues. This deeper aspects of knowledge will be called 'know-why'. One hears quite often that graduates of two year associate degree programs have acquired a skill set that is marketable because it can be put to use right away by an employer. Four year degree graduates, on the other hand, have the analytical skills and the deeper understanding, but not the specific training and local orientation to make them

productive right away. The technician has know how, the engineer has the know why. This deeper understanding is necessary when things go wrong or need to be radically modified for a very different set of operating conditions. This understanding also is useful if components, systems or processes are operated beyond their normal envelope.

From the technology provider perspective, know why is more valuable, harder to acquire and much more difficult to patent. In the areas of core competence, the know why is closely guarded. Know why is the intangible counterpart of know how. All this is not to suggest that know how is useless or inferior. Not at all. Know how makes a technology work. From a technology adopter's point of view, know how is more important. In the sixties and seventies, scores of graduates from developing countries in Asia and Africa went to European and American universities and returned home. Many became very frustrated because they could not translate their knowledge into products and processes in their home environment. At the risk of over generalization, universities gave them know why, but they lacked know how. The proper directed industrial and commercial experience could have given them know how.

'Show how' is a notion that captures the essence of technology transfer by doing. There are many very small but important aspects of a technology that are not codified or written down in any way. Some aspects do not lend themselves to documentation. Some relatively simple activities have very complex theoretical underpinnings. Take cooking for example. The chemistry of food processing is extremely complex. Why does one person's 'genuine'

hand tossed pizza taste better than another person's in the same shop? Case studies of bakeries in Japan [9.8.40] showed that the most subtle actions had to taught by the master to the apprentice. The apprentice would try to imitate the master. The master would watch and correct the apprentice day after day till he got it right. This is the essence of 'show how'. There are many technologies such as violin making, bespoke tailoring, paper making, brewing, and automobile body sculpting and finishing which require show how to transfer the technology. This is very dependent on the attitude and availability of the master as well as the patience of a suitable apprentice. When agreeing to technology transfer contracts, technology providers should ask themselves the questions: ' Is there much show- how in this? Who will do the transfer? Can we and are we ready, willing and able to make this person available for this task?'

One of the problems in technology transfer is that , sometimes, neither the provider nor the adopter is very clear in their own mind about what it is that they are agreeing to in terms of technology . The provider is thinking in terms of transferring just the know how. The adopter thinks he is going to get it all- intellectual property, know why, know how and show how. There is a 'discrepancy in expectations'.

More and more, modern technology is trying to get away from show how. It is under pressure because of the drive for efficiency and lower costs. Elaborate special machines and processes are designed and built to 'take the art and mystery out of it'. Tire balancing, engine tuning, wheel alignments etc. used to require craftsmen. Now we have machines

being operated by employees with a few hours of training. Our complex military hardware is maintained by technicians in their teens and early twenties who are trained very quickly to spot and replace suspect parts using very sophisticated equipment that is relatively easy to operate and whose results are easy to interpret.

Recognition of the distinctions between know-why, know-how and show-how will help reduce the discrepancy of expectations between technology providers and technology adopters. This will help prevent misunderstandings and increase the probability of a successful technology transfer.

## Section 3.4: Nationality As an Aggregation of Cultural Variables

What constitutes a nation? This question is not being posed in a philosophical or social or political context. It is being asked in a technology transfer and business sense for existing countries. Insights are being sought that will help transfer technology across national boundaries more successfully.

Right away, it has been stated that a nation has a geographic outline- a border or boundary. This boundary is generally recognized by other nations . Recognizing that there are border disputes, a nation has sovereign rights such as its right to self determination, its chosen name, its flag and anthem, its decisions as to who goes in and out , what political and legal system is to be used, what to call its money and how to give it value, how to maintain law and order and police its borders, tax its citizens, handle its finances and conduct its relations with other nations.

It is useful to review what has not identified. Language is not necessarily the basis of a country. There are many countries who speak the same language. Take English and Arabic for instance. Religion is not the determinant. There are many different Christian, Islamic and Buddhist countries. Communist countries do not acknowledge religion. Ethnicity is

not the defining characteristic. Take Taiwan and China, Bangladesh and India (West Bengal) or Pakistan and India ( Punjab). Geography is not a good guide. Boundaries do not follow rivers or other natural demarcations. The United States shares a very large border with Canada which , in the prairies, has no distinguishing geographical characteristic. Common history is not always reliable either. Malaysia and Singapore had a common history till Singapore split off. Countries such as India and Indonesia defy logic. They are extremely diverse geographically, ethnically, linguistically and regionally and have citizens of almost every major faith. The list goes on: Switzerland, Malaysia, and Nigeria. What is the significance of this to technology transfer?

As a first estimate, one could conduct a technology culture interaction assessment using the nation as one unit. With increasing familiarity , as the technology becomes more culturally reactive or interacts at deeper cultural depths, we may have to break down the unit of analysis called ' nation" into its constituent regional or other groupings for a full CAMPS analysis. One may have to do assessments by region or some other application oriented aggregation of cultural variables. Marketing people have been doing it for quite some time and anthropologists think it is only natural. First time business men and technology transfer professionals may fall into the trap of thinking that international technology transfer automatically implies that the appropriate unit of analysis is a 'nation'. It may be, but it is not a given. One does not need this added peril of a false sense of security in international technology transfer activities.

## Section 3.5 : Japanese Perspectives of Technology Transfer

The rapid rise of Japan as a technical and economic powerhouse has been accompanied by the spread of Japanese businesses around the world. Japanese eminence in complex, highly engineered industrial products, consumer durables and semi- durables has been partly a result of their insistence on high quality and reliability, their keen sense of observation, dedicated customer orientation and relentless pursuit of market share. The products that Japanese companies excel in are exactly the products that developing countries want and value the most. SE Asian countries have watched as Japanese technology progressively displaced Western technology , sector by sector, in Korea, Hong Kong, Taiwan and Singapore as these Asian tigers transformed their economy and raised their standard of living.

The Japanese approach to technology transfer is , as one would expect, different from that of the US. One could liken the earlier US technology transfer approaches to laying sod in response to a customer request for a lawn. The job is done fast, it looks good and the whole relationship has a clear beginning, a middle and a clear end. The process is visible. The provider moves off, and the proud new owner has envious neighbors. If the customer has a problem, he or she will have to call the provider who may or may not

come depending on the contract and the possibility of new work, reputation, current commitments and so on. The Japanese version is to provide gardeners who will grow a lawn from seed. They will study the climate, the soil and the neighborhood and listen carefully and actively to what the customer wants. They will pick the right seed and work with the customer to grade and prepare the soil. They will be there for a long time and will ask the customer to develop an interest in the lawn, spend time on it, fertilize, water and fight weeds. The gardeners will be around much longer and the job will not have a clear beginning, interim milestones or clear end. The Japanese point of view is that continuous vigilance and improvement is necessary for a good healthy lawn . There is identification with the job. Which one is more appropriate would seem to depend on the mentality of the customer and the expectations. It has been suggested that if someone wanted stepping stones, they should call a US company, if they wanted a detailed paved stone walkway, they should call a Japanese company. So much for generalizations.

Japanese zaibatsu and keiretsu relationships have been discussed at length in the literature as has their vaunted supplier relationship development [9.8.9 and 11]. This affects international technology transfer as well. 'This is because international transfer of special knowledge, soft technology or know how possessed by an enterprise, especially management methods and human organization systems characterized by Japanese style management, is greatly facilitated by internalized parent-subsidiary transactions. In other words, external contracts or arms length transactions pose a major obstacle to this type of international transfer'[9.8.31].

'Our studies also reveal that the efforts made by Japanese firms are not fully understood by local communities. In the matter of technology transfer, for example, local governments, economists and journalists are under the firm impression that the withdrawal of foreign staff from a foreign owned subsidiary signals accomplishment of the technology transfer process. For this reason, European and American firms have a good reputation in this area because their staff is called back home quite soon after operations commence and technicians are sent in only when problems arise. A high rate of promotion of local staff is also valued. Compared to this, Japanese technicians stay on in the new firms, creating the impression that Japanese-owned firms are neither interested in nor serious about technology transfer.

Although technology transfer is highly recommended and valued by local governments, a recognition gap between the donors and recipients at times causes misunderstandings. It is important to understand that Japanese affiliated companies base their technology transfer on On-The-Job-Training(OJT). European and Americans basically utilize written manuals and job descriptions. Since it is easy for workers to see and follow manuals, local people seem to be happier. Japanese companies have more vague descriptions that lead to misunderstandings between local workers and managers. Technology cannot be written into manuals because it is constantly evolving to a higher level. The difference is that when the factory is working smoothly, the Americans withdraw. The Japanese stay on to continue to train the workers, step by step, in maintenance and repair, product upgrading

and so on. This requires less people being flown in at short notice. Americans and Europeans fly in the experts as needed and go back home again.'[9.8.33] . In his book 'Kaizen'[9.2.31], researcher Masaaki Imai explains the philosophical differences between the Japanese approach to continuous improvement and his perception of the Western approach to innovation. Two tables excerpted from his book and reproduced below are helpful in understanding the two approaches.

| Attribute | Kaizen | Innovation |
|---|---|---|
| effect | long term | short term, dramatic |
| pace | small steps | big steps |
| time frame | continuous | intermittent |
| | incremental | discontinuous |
| change | gradual, constant | abrupt, volatile |
| involvement | everybody | selected few, champions |
| approach | teamwork | rugged individualism |
| mode | refine | scrap, rebuild |
| spark (motive force*) | conventional | breakthroughs |
| | state of the art | new theories, approaches |
| finance | small investment | large investment |
| | large maintenance | small maintenance |

* parenthesis and explanation added for ease of understanding

| Attribute | Kaizen | Innovation |
|---|---|---|
| orientation | people | technology |
| evaluation criteria | better process | higher profits |
| advantage | suited to steady slow growth economy | works well in rapid growth economy |

| Kaizen | Innovation |
|---|---|
| adaptability | creativity |
| generalized | specialized |
| information sharing | proprietary information, advantage |
| cross functional | line-staff organization |
| comprehensive feedback | limited feedback |
| build on existing technology | seek out new technology |
| attention to detail | big picture |

Comparison of Japanese and Western Innovation Style

Kaizen is seen as the process in between innovations. 'Management should practice Kaizen while searching for new ideas. The irony of western management is that the higher up the manager is in the organization, the more preoccupied he becomes with short term

results. Western wisdom has been that higher quality and smaller lots lead to higher costs. Workers need not be consulted. The Japanese wisdom is that higher quality leads to lower overall costs and flexibility can accommodate lower lots. A thinking worker is a more productive worker.'

In Asia, both Western and Japanese style technology transfer are at work. Australia is a particularly interesting situation. It is a continent that is a country that is seeking its identity. Australians are transferring their agricultural know how to their Asian neighbors to the north. They are developing their own style.

## Section 3. 6: Technology Strengthening: A Suggested Host Nation Paradigm for the Transfer of Automotive Technology to SE Asia.

Quite often a nation's political leaders declare a national aspiration to galvanize its citizens and pick a prestige project that can capture the imagination and the hearts of its citizens. America did it when President Kennedy challenged the nation to ' put a man on the moon before the decade is over'. Japan and Korea have succeeded in creating automobile industries for themselves. For close to twenty five years, Thailand, Malaysia and Indonesia have tried to build their own brand of automobiles. The goal has proven to be elusive. What does it take to succeed?

The automobile is a unique product. It is by far the most expensive semi durable product that an individual purchases. Once sufficient citizens in a society reach middle class status, with a discretionary disposable family income close to a fifth of the purchase price of a car, the pull to buy a car is inexorable. Status, utility and all the motivators we can identify, feed the urge. Americans often talk about their love affair with the automobile. Entire shelves in libraries are devoted to books written on the subject. An automobile contains between four to ten thousand parts depending on how one defines a part, how complex the design is and how many options there are in the car. By any measure, a car is

a complex piece of modern engineering that incorporates over a hundred years of research, development and real world feedback. Regulations on safety, pollution and physical characteristics vary from region to region, are constantly in a state of flux and have to be met. Servicing, warranties, parts availability and other obligations have to be met by after-sales networks. Financing of automobiles strongly affects sales. Today the world's most commercially aggressive, technically competent and adventurous companies compete in the international car market where global supply exceeds global demand by about 20%. Mergers, acquisitions and bankruptcies of experienced players is commonplace. Investments in car plants are staggering, model changes every two years are not considered fast enough. Excellence, reliability, durability and value for money are just the admission price to the arena. New technology is rapidly being introduced both in the product and the manufacturing process. Speed to market is crucial.

Major auto assemblers buy the majority of the cost of the car in the form of parts from chosen, trusted and contributory suppliers. Level two, three and four tier suppliers themselves fight it out for survival with their respective competitors. Global auto companies are lean, very smart, nimble, battle hardened and brutal to their competitors. They are also very attuned to their many markets. They are totally dedicated to their customers. This is not an industry where government money, support and restricted market access can protect domestic companies who do not have the 'right stuff'. This is not an industry for the faint of heart. The automobile demands a very complex and efficient collection of industries to feed it.

Why did Malaysia, Indonesia or Thailand not succeed in their quest? Even the concept of 'complementation' between the three and the Philippines did not achieve the chosen objectives, A review of the SE Asian automobile industry using single discipline tools provide only partial answers. Multi-disciplinary methods of technology transfer are needed to research the problem.

A hypothesis that needs evaluation is that host policy makers need to pursue 'Technology Strengthening' objectives that build more general skills than those identified for just the tasks at hand. For example, making automobile engines requires an industrial base that includes casting, machining, materials science, quality assurance, process control etc. Host nations tend to solve the most immediate pressing problem for a given project. The rapid changes endemic to the automobile industry are such that targets moves faster than their achievement. This results in overall frustration. Success is perceived in terms of technology positioning relative to others rather than in absolute terms. Real progress has been made by some assemblers in SE Asia, but the end objective of becoming 'self-sufficient' in the manufacture of automobiles so that current account deficits can be turned around to current account surplus, has not been achieved. 'Technology Strengthening' suggests that government policy makers and captains of industry need to 'act in functional concertation' as Professor Richard Doner aptly puts it [9.8.11] to create a climate that allows not only large, but small and medium sized companies to progressively acquire skills that upgrade them to take on increasingly challenging technology undertakings that

have attendant profit margins. With relatively open markets , a sound legal framework and an investor-friendly environment, industry will attract and retain quality Trans National Companies who will invest as well as add value to domestic technological capability because it will be in their interests to do so and not just because they are negotiated into agreement by the host government pitting several international bidders against each other.. Because international competition is so intense, any large opportunity to build automobiles will attract major players. The ideal is to create a situation which will attract the players who are right for the country in terms of long term relationship and partnering.

'Technology Strengthening' suggests a general drive that is adjusted for the differing needs of short, medium and long term goals. Tactics must be guided by a strategy that is based on a common shared vision. It recognizes that small/medium companies are generally product focussed, large companies need to master processes and the government and trade associations need to keep their eye on progress relative to a realistic time table towards building overall technological capability . In such a policy, the government would ensure that universities create an adequate pool of qualified engineers/scientists, trade unions would understand broad policy goals and take part in the training and development of craft apprentices , large companies would provide broad based industrial and management training and the small/medium sized companies would give hands-on specific opportunities and practice in niche skills for their products to tradesmen. Trade associations would ensure that market feedback is true and strong and is factored into corrective policy adjustments for medium and long term objectives. Trade and junior

colleges would gear themselves to educate required technicians . The armed services would release people trained in required esoteric skills into the civilian market that trade unions cannot provide. Thus requires continuous monitoring since shortages of technical persons constrain growth while surpluses result in unemployment of the educated-the worst kind of social malaise: the kind that causes political undercurrents , emigration of the skilled, brain drain , demoralization among graduates and teachers in the short run and aversion to technical pursuits and falling enrolment in technical institutions in the long run. Some questions that arise are: What is the appropriate level of government participation and intervention at a technical level? How does this impact state owned enterprises which are not subject to the discipline and correction of the marketplace? What accommodation does the tech transfer process have to make to the industrial and legal ethos of the host nation? Are embedded cultural values being reconciled or are they being driven underground only to re-emerge in other forms of resistance? What technical infrastructure deficiencies need to addressed in the short, intermediate and long term? How can critical technical decisions be identified and characterized so that political and social considerations do not overwhelm them into failure? Can a compromise be reached that will allow sound decisions to be made without abandoning long standing political and social platforms? How can we adjust the metrics of successful technology transfer so that that overall industry development policy is tuned to ensure that the technology gap is continually narrowing ? Technology Strengthening is a comprehensive policy that appears to have promise.

In addition to the above, host nation policy should create an attractive investment climate for the automobile industry. While the government is looking for political appeal , industrialists are asking a different question: 'Does it make commercial sense?'. Many host nation policy makers are comparing their initiatives and asking the question ' Is not the industry more attractive than it was before?'. The more telling question is " Is the investment climate here better than the other alternatives an international investor has in other countries?'. Quality investors are looking at intellectual property clarity, and adherence to World Trade Organization and World Intellectual Property Organization principles. They are looking for financial security, open disclosures, repatriation, convertibility and equal taxation. They are looking for markets that are ready and are likely to grow. All factors when added to technology strengthening , make for a complete policy.

## Section 3.7 : Law and Technology Transfer: A review of Key Considerations in International Business

{Acknowledgment: Parts of the discussion on patents, trade secrets and copyrights are based on the presentation by Kevin Burgess Ph.D. to the Law and Technology (L796.20) class at the Ohio State University on November 11, 1997 }

Background

Law is an integral aspect of business in the United States. US heritage, history, geography, and social processes have shaped the US legal system. Americans use the legal system both as a shield and as a sword. When US businesses interact with other countries, they need to be aware that the legal bases and the practice of law are fundamentally different ; it is not just a matter of degree but of kind. This paper touches on some of the more significant issues that impinge on the process of technology transfer. The major conclusions are: (1) It is a serious mistake to ignore the working principles of international law; one needs to be an alert and informed client; (2) Efforts made towards avoidance of a poorly conceived and executed contract, will pay off. It is difficult to get timely, fair and cost effective legal remedy after a contract is signed; (3) There is no substitute for an experienced, capable and trusted local lawyer to navigate through the unwritten as well as written parts of the legal system.; (4) Extreme care is recommended when choosing a technology transfer partner. There are issues of technology modification and adaptation

that has to be based on trust ; (5) Enforcement of the law and international judgments may be inconsistent ( or regional), protracted and politically influenced.; (6) Core or leading edge technology should rarely be licensed. Section 3.8 of the dissertation contains a companion discussion paper, Laws Relating to Business and Technology in Indonesia Today , which examines one SE Asian nation in more depth.

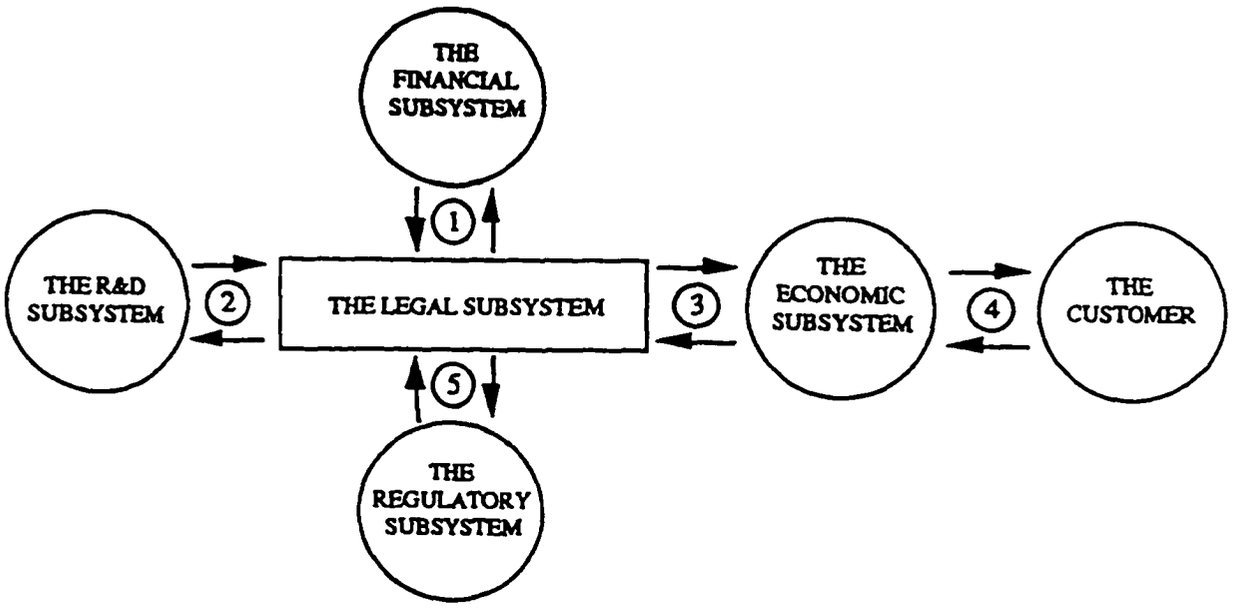
1.Introduction.

Law pervades so many aspects of American life that it is only to be expected that business and international trade in general, and technology transfer in particular, would be influenced by legal considerations. The purpose of this paper is to identify issues and principles that a practitioner of international technology transfer should be aware of. The intent is not to attempt independent legal interpretation or counseling, but to be able to communicate with lawyers and to avoid the more common pitfalls. The legal problems surrounding licensing, joint ventures and direct foreign investments are considerably more complex than those affecting the transfer of goods across borders under a traditional documentary sale. Figures 3.1, 2 and 3 show the legal underpinnings of a technology transfer process and are taken from lawyer Karl Dakin's book Technology Transfer [9.1.1].

* Foreign Investment Law
* Licensing Laws
* International Tribunals
* Dispute Resolution Mechanisms
* Tariff Barriers
* Non-tariff Barriers
* Franchising and Trademark Registration
* Profit Repatriation
* Investment Repatriation
* Transfer Pricing
* Currency Exchange Controls
* Letters of Credit
* Bills of Lading
* Insuring the Risk
* Trading with Non-market Economies
* Choice of Law Clauses
* Choice of Forum Clauses
* Enforcement of Foreign Judgments
* Expropriation Law
* Sovereign Immunity
* The Act of State Doctrine
* Extraterritorial Jurisdiction

KEY ELEMENTS OF INTERNATIONAL LAW

Figure 3.1




1. **The Financial Subsystem**
   - Tax Laws
   - Security Laws
   - Insurance Laws
   - Franchising Laws
   - Surety Laws
   - Mortgage Finance Laws

2. **The R&D Subsystem**
   - Contract Law
   - Intellectual Property Law
     - Patents
     - Trade Secrets
     - Copyrights
     - Trademarks

3. **The Economic Subsystem**
   - Antitrust Laws
   - Fair Trade Laws
   - Commercial Transaction Laws
   - Unfair Competition Laws
   - Corporate/Partnership Laws

4. **The Customer**
   - Consumer Protection Laws
   - Warranty Laws
   - Fair Trade Laws
   - Contract Laws
   - Tort Laws

5. **The Regulatory Subsystem**
   - Environmental Laws
   - Public Health Laws
   - Safety Laws
   - Zoning Laws

## *THE TECHNOLOGY DELIVERY SYSTEM'S LEGAL SUBSYSTEM*

Figure 3.2

| | U.S. Patent | Trade Secret |
|---|---|---|
| Legal Requirement: | New, useful, and not obvious | Not general knowledge in the trade; reasonable steps must be taken to protect secrecy. |
| Subject Matter: | "Any new and useful process, machine, manufacture, or composition of matter. [35 U.S.C. Sec. 101.] | "Any formula, pattern, device or compilation of information which is used in one's business, and which gives gives...an advantage over competitors." [Restatement, Torts, 1938] |
| Scope of Protection: | Can exclude all others from making, using, or selling the invention in the United States. [35 U.S.C. Sec. 154.] | Protection only against those who learn of the trade secret from the owner, or who improperly obtain it. No protection from those who develop the same information independently or by reverse engineering. |
| Duration of Protection: | Seventeen years from the date of the patent grant. | Indefinitely; until the secret becomes generally known in the trade. |
| Remedies: | Damages, not less than a reasonable royalty; can be trebled. Injunction possible. Attorney fees possible. Proceedings in federal courts only. | Damages, profits and injunction possible. Attorney fees possible. Proceedings based on state law. |

COMPARISON OF PATENT AND TRADE SECRET INFORMATION

Figure 3.3

Contract Wording : The person who drafts the international business agreement often holds the upper hand in subsequent negotiations. While legally trained persons in many countries share an affinity for written contracts that set out the full extent of every right and duty of each party, the practice of business men in many Asian countries tends to leave out the details- this leaves room for flexibility as the relationship develops. Adopters may object or resist bargaining on the details saying 'all this is of course is understood' or 'this is a part of our law'. If contracts are written to foresee and cover all contingencies, the document is likely to be quite large and complex. The Asian technology adopter is likely to interpret the contract as evidence of a lack of trust. Business contracts in Asia are relatively short on the fine print but do carry a lot more verbiage expressing warm fuzzy intent which can be interpreted by either side to suit the circumstances.

The question that arises then is: how should the contract be couched? In general and loose language or in very tight and specific language? At what stage should legal counsel be introduced during face-to-face negotiations? Experience in PRC has been that negotiations continue after the contract has been signed. In fact, someone has suggested that negotiations are not over till the last cent changes hands.

3.Choice of Law, Forum/Jurisdiction and Language

It seems to be intuitively obvious that the parties in an international transaction should decide up front which law will govern the contractual relationship. The Choice of Law in

effect guides the selection of substantive law that will govern. This will in turn set the overriding terms of the arrangement. The terms of the contract will add to this. Laws expressing strong public policy, called 'jus cogens', are fundamental or "mandatory" rules of law, the operation of which parties may not contract away. These mandatory laws vary from country to country. The Choice of Law clause in an international contract is highly recommended. Courts can still refuse to enforce such a clause because it is found to violate public policy.

When two parties come from different language backgrounds, then it becomes important to decide which language version of the contract will prevail. Translations are not accurate and even if they were, words carry a legal tradition and connotation that can cause difficulties. Languages like Mandarin are very rich in allusions. China's legal system considers the State as the Head of the Family. Law is instrument of control, not a vehicle for protecting individual rights. There is no tradition of due process and presumption of innocence. The magistrates have sweeping powers but are 'guided' by Confucian principles of moral responsibility. The use of Li- eliciting good behavior and social harmony through moral force and Fa- punishment through the application of criminal law are balanced in the ideal. The choice of language is not independent of the choice of law clause.

The contract must include a Forum Selection Clause that specifies the court which has jurisdiction and it should stipulate the name of the court that has exclusive jurisdiction

to preclude other courts from trying the case. There have been instances of courts overruling choice of forum clauses because it interpreted the clause as an attempt to interfere with judicial administration by depriving a competent court of jurisdiction. Although Forum Selection Clauses are presumed to be valid, they may not be enforced in the US if they deny one party an effective remedy, cause substantial inconvenience, are a product of fraud or unconscionable conduct or contravene US public policy. Many of these grounds for resisting application of a Forum Selection Clause are analyzed by the courts under the rubric of "reasonableness" or "changed circumstances". The ultimate Forum Selection Clause is one that chooses no court at all, but selects an alternate dispute resolution mechanism, such as an arbitration tribunal . Failure to stipulate the applicable forum of law due to neglect or oversight could result in the host country choosing mandatory arbitration as a means of resolving disputes in a third neutral nation.

Although parties to an international commercial agreement may not be able to prevent a court from disregarding a contractual choice of forum or choice of law, the risk may be lessened in a negotiated agreement which states why the choice of forum and of law are considered reasonable in light of a planned transaction.

Recourse to local courts may lead to surprises for US businessmen. Courts may not be immune to political pressure and can be persuaded to render "politically correct" or "socially correct" judgments. Judgments from abroad when brought to the US are not enforceable per se- although there is no rule prohibiting enforcement. The result is that the

courts have been left to their own analyses to develop policies and rules. Conversely, judgments of US courts are not enforceable in two thirds of the countries of the world or are enforceable only if certain conditions are met.

Dispute Resolution

It is to be expected that some disagreement is likely to arise in international tech transfer due to misunderstandings, changing conditions, modified expectations or simply because of souring human relations. The three broad avenues are mediation, arbitration and litigation. . The following tabulation summarizes the considerations for choosing between litigation and arbitration.

Advantages of Arbitration:

Flexible , Pre-screening: can choose panel members in advance

Professional technical experts can be selected as well as lawyers

Choice of arbitrators can a bargaining chip. Process can be quick, relatively inexpensive and private; arbitral awards are confidential and not matters of public record.

Disadvantages of Arbitration

Can only work if both parties agree to it

In the case of binding arbitration, there is no appellate process.

Advantages of Litigation

Well established and understood process, in wide spread use.

Note: litigation cannot be replaced by arbitration where several parties are involved.

Disadvantages of Litigation:

Can harm future business

Residual bitterness may be long lived

CEO of one side may be proud, stubborn and unreasonable

Posturing of either side can prolong process

Delaying tactics can be introduced if one side wants time and is not interested in settling or in driving up the costs to bankrupt the other side.

Unethical lawyers may sense deep pockets and drag out the process

Arguments are public and may be embarrassing or painful for litigants who are private.

Outcome is not foregone- hence the litigation. Either side may have unrealistic expectations

Enforcement of judgment may be difficult and a long time coming.

*Mediation* is a means of dispute resolution that requires both parties to agree to its use from the beginning to the end of the process. The mediator does not have the power to come up with a binding agreement. The mediator only has the ability to guide the reconciliation process to a satisfactory conclusion. If at any time, one of the parties decides to opt out, the process fails.

In Asian cultures, if one is allowed to simplify and generalize, access to law is taken when most other methods have failed. Litigation is viewed as a matter of picking up the pieces of a broken relationship. In the US , access to law is almost routine to resolve disputes.

This probably has its roots in the pioneer mind-set and highly pronounced emphasis placed on individual- rights and how they relate to corresponding social limits that are necessary to make the system work.. In Asia, on the other hand, social harmony is highly cherished. Personal sacrifices for the greater good of the family, company or society is socially commended. Accommodation and compromise are acceptable. Mediation and arbitration are much preferred over litigation. Public reputation and image have a more profound effect on future business opportunities. One may win a court case, but the public embarrassment and humiliation and residual resentment will probably ruin the business relationship. Because of family and kinship networks, the chances of entering into or continuing business relationships with many other parties is also greatly diminished.

5.Intellectual Property: It is very well known that the US is at a comparative disadvantage with Asia and Latin America on the basis of labor rates. What the Us has going for us is its investment in research and development, its innovative ability, creativity, product development prowess and its well developed and receptive market for high quality goods and services.

These are the reasons for the interest in US technology overseas and the activity in international technology transfer. Reputation and intellectual property are two of the most valuable intangible assets of a company .

There are three levels at which technology can be transferred: product, process and capability. At the product transfer level, the technology provider coaches the technology

adopter on the making of the widget. At the process transfer level, the adopter learns how to set up a process to make widgets and how to trouble shoot the process and to modify it to changing conditions. At the capability transfer level, the adopter is fully capable of going it alone and even teaching others how to make widgets or even help a third person set up a process for making widgets. Before meaningful legal considerations can be given to tech transfer arrangements, it has to be established from the outset, what the purpose or intent and extent of the tech transfer is. Is it at a product level or process level or capability level transfer agreement? This sets the stage and tone of the entire contract. It influences the contents of the contract, its wording and interpretation and its provisions for dispute resolution. At the heart of the matter is the ownership of the technology. The basic concern is scope of protection of intellectual property and this depends on understanding of the basis of the transfer. The provider's viewpoint generally has been that unless clearly specified otherwise, the provider still retains ownership. The adopter's viewpoint tends to be the opposite. 'Pharmaceuticals have long been a point of contention in world patent law between developed and developing worlds. Many nations argue that their people should not be held hostage to patent rights. Furthermore, pharmaceuticals are one of the relatively few high tech industries that developing nations are capable of reproducing without significant licensing of technology.'[9.6.14]

Intellectual property protection is usually analyzed under the following categories: patents, copyrights, trade secrets and trade marks ( a variation of which is service marks)

and know how. Patents are the most utilized of the intellectual property options. The subject matter of a patent must be novel, non-obvious and useful. Laws of nature, physical phenomena and abstract ideas are not patentable, applications may be. This has caused a flurry in the software industry. Is an algorithm patentable without a specific application? The spreadsheet battle between Lotus 1-2-3 and Borland's Quattro should be recalled. The policy rationale of a patent is that, in order to further science and art and to allow an 'inventor' to profit from his or her invention unencumbered by competition, the government grants a limited monopoly for the invention in return for a full written disclosure. In the US, the first to invent can obtain the exclusive right to the invention. In other countries it can the first to file. Patents have to be filed separately in different countries. The full patent disclosure and the requirement, that the application must disclose the best mode contemplated by the inventor for implementing the invention, means that patents can be infringed abroad unless legal action is taken and judgments ( injunctions such as restraining orders or money damages) are enforced.

Trade secret protection is fragile since the right to enforce a trade secret is dependent to a large extent upon the owner maintaining its secrecy. Figure 3.3 compares the features of patents and trade secrets. It should be noted that trade secrets are not covered by federal statutes per se. Most arguments resort to the notion of unfair competition. The Restatements of Torts 757(1939) provides an indirect definition of the existence of a trade secret: (1) The extent to which the information is known outside the business; (2) the extent to which it is known by employees and others involved in the business;(3) the

extent of measures taken to safeguard the secrecy of the information;(4) the value of the information to the would-be owner of the trade secret and to competitors;(5) the amount of money expended in developing the subject matter; and (6) the ease or difficulty with which the information could be properly acquired or duplicated by others. Trade secrets are best not disclosed at all ( The recipe for Coca-Cola!). If it needs to be then it should be carefully covered in the contract. Special obligations exist in agent-principal and partnership relationships.

*Copyrights* are legally protected rights to original works of authorship and were of interest to 'creative artists' such as to musicians, painters, authors and graphic artists. Derivative works such as movies made from books are also covered.. With the advent of computer programs, some of which have great commercial value, the field of software copyright protection is becoming a very active one. The threshold of required originality is very low. Some individual creativity needs to be demonstrated to differentiate it from previous works. The new work must be fixed in a tangible field or expression such as ROMs. Disks, CD-ROMs etc. Software piracy has become a very major problem in China and many other countries. The US loses billions of dollars a year because of the ease of replication, underground distribution systems, and a lack of government motivation in stopping the process. An important limitation of copyright protection is that the ideas, procedures, processes, systems, methods of operations, concepts, principles or discoveries are themselves not protected, but the expression of them are. There is considerable room for interpretation! We only have to recall the fight between Apple and Microsoft on the

Windows 95 on the use of overlapping windows and mouse navigation. In US law, the plaintiff has to demonstrate copyright ownership, show that the defendant copied the work and that is substantial similarity between the two works .

Trade marks require separate registration under the law of each nation. Many trade marks are offensive to other cultures and cannot be registered. National flags, images of gods, saints and prophets, sexually explicit material are examples. In many countries it is possible to register service marks or certification marks ( recall the international wool mark?). Trademarks can be continuously renewed. US businesses have been very active in this field. Franchising agreements rely heavily on service mark protection.

The legal interpretation of know-how is any commercially valuable knowledge. It may or may not be a trade secret and may or may not be patentable . If someone is willing to pay for it, it can be sold or licensed. Legal protection for know-how varies from country to country and is, at best, limited. Unlike patents, copyrights and trademarks, one cannot, by registration obtain exclusive legal rights to know-how. The tech transfer definition of know-how is of value when assessing an adopter's readiness to receive a specific technology and the provider's ability to impart it. The legal definition of know-how is of relevance when negotiating the price for a tech transfer service and when circumscribing expectations for the non-technical members engaged in the commercial side of the endeavor. Both aspects need to be recognized by businesses.

Know how is best protected by explicit provisions in the contract between provider and adopter that spell out scope, rights and responsibilities. This limits legal exposure

It is quite clear that the technology owner must not only file the patent in the intended country of business, but must have it registered/approved before initiating contacts for licensing. The Japanese have a practice of filling numerous and interlocking patent applications to make it very difficult for others to infringe on the core patent- a sort of defense in depth.

Quite often it becomes necessary to modify a product or process to make it work in its new environment. It may be due to scale, climatic conditions, electrical voltage/frequency differences, metric versus American sizes and so on. The product may in fact be 'improved" - this happens with Japanese and German adopters. Who owns the 'new' technology now? 'Unlike most tangible conventional products, technology products can evolve and grow into more valuable assets as a result of improvements realized through commercial use and continued change. There are grant back clauses that cover many of these situations. These involve granting back a royalty free non-exclusive license to the original licenser for the practice of the original technology. This usually gives the right to the original licenser the right to disclose the improvements to other licensees of the same technology.. Grant forward clauses give the licensee the same assurance that they will get updates without having to negotiate all over again. Such clauses should be considered and the appropriate ones included in technology transfer licensing agreements.

Some governments require technology transfer agreements to be registered and royalty formulas to be approved by the government. This is now becoming unfashionable and technology providers are well advised to steer clear of such situations. They have very often become an untenable nuisance.

There are several downsides to technology transfer. A future competitor may be in the making. Products licensed for use abroad may find their way back in to the US as either 'gray market ' products or as parallel imports; the former may have different features than the US trademark products but meet US safety standards, but do not have any warranty Parallel imports are products with US trademarks but may not be identical to the US product in quality. Parallel products are imported without permission of the trade mark holder. Products produced with transferred technology and cheap local labor may be dumped in the US. Dumping occurs when goods are introduced into the commerce of another country at less than their fair market value (customarily the price charged in the home market). This brings in issues such as subsidies which the US feels is against the principle of free trade. This is a complex subject of development economics, hidden subsidies, indirect subsidies such as tax breaks and so on.

6. Customary law and choice of local legal counsel

Many developing and non market economies have specific laws governing the transfer of technology. It would be a mistake to assume that they comprise the totality of the legal framework. Each nation has another level of law, that which is unwritten. It is "the way things work", a working code or customary law. It subsumes rulings and judgments that are applied in some cases and not even mentioned in others. The unwritten workings create the most concern for unfamiliar investors and their counsel. " Many socialist and developing nations have 'aspirational declarations. They are written but they are not law. They are of great importance because they disclose the current sentiments and potential future law of the nation They create a norm of expected moral conduct for multinational companies'[9.6.14] They are more than a moral code and should not be dismissed as just rhetoric. It is for all the above reasons that businessmen carefully choose experienced local counsel to guide them through .

7. Export Controls

The major reasons for export controls are: protect the domestic economy from excessive export of scarce materials; for foreign policy reasons such as sanctions, trade war and embargoes; and for protection of national security. It should be recognized that there is a US Department of Commerce Control List (CCL) that has ten general categories and five product groups two which are software and technology! Destination countries are also grouped from the most friendly such as the UK to the most restricted such as Iraq and Iran.. Exports are permitted under a general license and a validated license which is

specific to a particular instance: a particular shipment to a particular country. Violators of export control acts can make offenders liable for criminal prosecution and penalties can include fines of five times the value of the export and six months in jail.. Since technology can have dual or more uses, it is prudent to check with the Department of Commerce before initiating export of technology. Computers and software pose particularly thorny problems. For example the export of complex encryption codes was halted because communications overseas between clandestine and undesirable groups would be secure. Presently their codes can be cracked by government experts.

8. Treaties, Trade Agreements and International Bodies

The US has been a leader since World War II in the regulation of international trade law and has played a major role in the development of the General Agreement of Trades and Tariffs (GATT). This is a multinational treaty that has the stature of law in many countries that have adopted it. It then becomes part of the domestic law. There is no GATT organization to police or implement the treaty. The US Congress never approved of the International Trade Organization (ITO) as a secretariat for monitoring the treaty since it was felt to be a violation of our sovereignty. GATT is linked to our well publicized Most Favored Nation (MFN) rankings and has become an instrument of political and trade policy to push non-market economies toward free market principles and political and economic reform. GATT was originally aimed at goods not services.

The emerging World Trade Organization shows promise but has not replaced the role of GATT. We should recognize that Non Tariff Barriers (NTB) are just as important in influencing trade as tariff barriers. Examples are quotas, local content requirements etc.- in fact a host of criteria other than the market criteria of price, quality and delivery.

The late 1993 Uruguay round on Trade Related aspects of Intellectual Property Rights (TRIPS) resulted in a major trade agreement. The US has ratified and implemented the agreement. The TRIPs code covers the gamut of intellectual property. Achieving a General Agreement on Trades and Services (GATS) has been a major focus of US policy since services account for a large percentage of our national output. It has met with heavy opposition since developing nations feel that they cannot let go control of their banking , telecommunications, insurance and professional businesses to more aggressive and competitive US companies.

9. Differing Legal and Scientific Understanding of Causation

Communication difficulties between the legal system and the scientific community as exemplified by 'the trial courts' rejection of empirical information is best explained by the profoundly differing understandings of causation. Law trained people tend to understand causation as deductive and operating in specific instances. The legal model of causality draws from a Newtonian world perspective. The if-then model permeated science throughout most of the 19th. century and continues to permeate legal reasoning to the present. In contrast, scientifically trained people tend to understand causation as operating not only deductively but also inductively and operative upon a field over a class of

instances. The latter model of causality draws from a technologically more advanced notion of post-Newtonian science and statistical analysis. The discovery of quantum mechanics, particularly , forced science early in the 20th. century to develop this second understanding of causation. Modern computer technology facilitates the statistical analysis of probability. This modern mode of thinking about causation has created a technology of statistical analysis that is commonly applied to science but not to law. To a scientist trained in the technology of statistical analysis, the element of chance exist in the empirical analysis of virtually all phenomena. To an empirical scientist, the observation that mere chance confuses the data does not end the analysis because it is precisely the analysis of chance that leads to the rejection or confirmation of the theory.. The failure of the scientifically trained community to communicate effectively to law trained decision makers occurs in many areas of law that require statistical and inductive models of causality. Current Federal Rules of Evidence provide trial court judges with no clear direction about how to deal with information such as statistical data, or what effect, if any, social science findings accepted in one case should have on later cases. A second simple explanation lies in the observation that lawyers are not trained in modern inductive reasoning. Although the undergraduate majors of law students are diverse, majors in the empirical sciences are rare. Law schools provide very little training in social science methods. Social science findings describe the world as it is rather than how it ought to be. In contrast, the work of law is to provide access to justice; that is in part, to do what ought to be done in assessing blame in a fair manner for events that have gone wrong. Because the law views jurors as autonomous agents, personality traits that might only reveal themselves probabilistically

among jurors as a class are discounted. The American legal system has traditionally embraced a highly autonomous understanding of human behavior. This understanding is supported by the American ethos of rugged individualism and is consistent politically with laissez-faire capitalism.

The present resistance of the legal community to social science findings can thus be seen as several layers thick. The outside visible layer is the simple lack of procedural devices whereby such data can initially penetrate the legal system. This outer layer is supported by a secondary inner layer of legal education that is mostly ignorant of the basic scientific understanding of inductive and probabilistic causation that might utilize such procedural devices. Finally, at the core, is a belief system that adheres to a highly individualistic and autonomous concept of individual responsibility, a belief system that is hostile to much of what the community of social science might provide,'[9.4.1].

Postscript

There are many other topics which can come into play in technology transfer. Trade in services, risk analysis, investment and ownership are a few. In addition to local counsel, US businesses usually retain lawyers in the US experienced in international transactions. This review should give businessmen pointers as to what to look for when selecting legal services.

## Section 3.8 : Laws Relating to Business and Technology in Indonesia Today

(A Country Case Study)

Historical Review ( Current as of March 1,1998)

Indonesia is an ancient society that has gone through waves of influences over thousands of years. Consisting of about 1700 islands that stretch across three thousand miles of the equator and that lie in the path of major historical sea trade routes, Indonesia possesses a dazzling variety of languages, customs, religions and cultures. It is the fourth most populous nation on earth after China, India and the US. Rich in spices and natural resources , it attracted merchants and traders from China and India over three thousand years ago. Hinduism and Buddhism had a very significant influence on the Javanese and Balinese society for the first twelve centuries Islam came to Indonesia in the thirteenth century soon after it established itself in India. The majority(about 85%) of Indonesians today are Muslim.

The English, Portuguese and Dutch all tried to colonize Indonesia, with the Dutch winning control in the seventeenth century. The Dutch imported Chinese laborers and traders into Indonesia to act as buffers between them and the native Indonesians. They created a special class of citizens .The Dutch imposed their own law in Indonesia without

trying to understand the existing schema or the needs of the subjects. It was their self interest and indifference towards the Indonesians that led to the plurality of legal systems. It is interesting to note that there was no historical precedent for this sudden imposition. Roman law was gradually applied across the empire. There was a " ius civile" for Romans and "ius gentium" for foreigners. The two gradually converged over a long period of time to be territorially applied throughout the Roman empire[9.6.11]. The approach of the British was arguably much more successful in this regard. The British got what they wanted by a more deft touch. They used diplomacy and cunning to establish their hegemony. The Dutch divided Indonesian Society into three population groups: Europeans on top, Chinese in the middle and Indonesians ( and Indians and Arabs) at the bottom. The Chinese were ruled by European law although their culture was and is quite different and distinctly Asian. The purpose of this special status was to drive a wedge into the society and to make sure that the Chinese were always beholden to them. Japan occupied Indonesia between 1942 and 1945 and abolished separate European courts.

Indonesia as a nation

After the war, Indonesians waged a freedom struggle against the Dutch. Much emotional debate raged about the nature of society and the vision of the new country. There were three major schools of thought: The Muslim representatives wanted an Islamic state. After all, Indonesia was and is the largest Islamic nation on earth. Of all the world's major religions, Islam is the most sanguine about its view that there is no distinction between society, government and the law. There is an Islamic way of life.. The second camp, the

constitutionalists were less concerned with idealism but were keen to delineate the separation of powers between the executive, legislative and executive branches of government. They maintained that individual rights needed to be protected from an all powerful state. They argued that individuals should have the right to express their feelings and opinions. The third group, the integrationists ,envisioned a society that "the people " , not individuals held sovereignty. In an integral state there would be no need for individual rights since the person and the state were one. Individual rights were a source of conflict with the successful functioning of the state. This view has a totalitarian and socialist flavor- not unlike the communist manifesto. As can be imagined, such diverse world views, combined with hundreds of languages, ethnic groups and religions were very difficult to reconcile. The acrimonious constitutional debates and compromise outcomes are the basis for the legal system in existence today. On June 1 1945, Sukarno, a political leader ,spelled out what he believed to be a consensual position on nationhood. The core was Panch Shila, the five principles. They are: belief in one supreme God, justice and civility among peoples, democracy through deliberations and consensus among representatives and social justice for all.

On August 17 1945 , Indonesia declared its independence. The next day a constitution was proclaimed. It was short ( 37 articles), vague and provided for a powerful presidency. Several months later, the system was changed to a parliamentary democracy by government decree. Indonesia gained its freedom in December 1949 partly due to US pressure on Holland to let go or face the withholding of Marshall Plan Aid. The now free

Indonesians drafted a new constitution in 1950. It was longer (146 articles), provided guarantees for individual freedom , espoused parliamentary democracy with a ceremonial President.. Unfortunately, a young nation led by inexperienced politicians, long on rhetoric and idealism was unable to deal with social and economic realities and the diverse constituencies jockeying for power and destabilizing the government for personal gains. Deterioration of the economy, widespread corruption and regionalism caused political fragmentation and deadlock in the 1955 elections.

In 1958, a group of military officers in West Sumatra, joined by intellectual elite and fundamentalist Muslims set up a rebel government . This was interpreted as a threat to national unity by the government. The CIA, against the advice of the US embassy, supported the rebellion because it felt that President Sukarno was communism inspired. Army leadership crushed the rebellion. The coup failed. In 1959, government decree returned the country to the 1945 constitution. The era of "guided democracy" was ushered in. The Army successfully maneuvered to progressively expand its role in the political process. The Islamic Party was banned. The military adopted a philosophy of dwifungsi or dual functions- that of protector of the nation against internal and external threats against law and order and the promoter of prosperity. Political stability and economic development were its priorities. The armed services lobbied and injected itself into the workings of the government until it had its fingers in every nook and cranny of society. Sukarno's fight for political survival caused him to ignore fundamental economic realities. He pulled Indonesia out of the United Nations in January 1965. He ran into

confrontations with Malaysia over territorial disputes. On September 30 1995, a bloody battle erupted between left wing insurgents (who killed six generals and a lieutenant) and the army leadership. Civilians used this opportunity to vent centuries of frustrations in communal bloodletting. Estimates of death range between 100,000 to 400,000 people. The army's response was led by General Suharto. More and more, President Sukarno tilted towards Moscow. Indonesia's economic condition became desperate in the early sixties. The currency had been devalued to one-sixth its original value. Widespread demonstrations climaxed on March 11,1966 outside the Presidential Palace, when President Sukarno handed over power to General Suharto and took a helicopter out of the Presidential Palace.

Suharto's rule under the name of the New Order continues to today. It espouses a strong state- relatively insulated from the interests of any single group and that perceives itself as the unifier of the nation . It does not shrink from militarily suppressing factions it feels are based on ethnicity, religion and regionalism. A core belief is that popular participation in politics should be limited. Realities of world power and economic relationships cannot be ignored. What matters is economic development for the benefit of the peasants, not the intellectual pursuit of a national identity or an international ideal. Surprisingly , such a perspective can be accommodated within the fluid and broadly worded concepts of Panch Shila. Says Bill Liddle, Professor of Political Science at the Ohio State University, 'These principles more generally represent a search ...for more broadly inclusive principles to bind together the diverse groups of an extremely pluralistic society. Pancasila has proven

to be an ideology of extreme longevity and flexibility. It has been at times-and often at the same time-both a forceful binding agent for a young nation and a powerful tool of repression.' Although there are elections every five years, no candidate other than the current President has come close to being considered seriously since 1966.

Footnote on the Chinese Minority: The small ethnic Chinese minority have been historically resented by the Indonesians because they had been treated better by the Dutch and had used their position and influence to amass much personal wealth. They were automatically suspected as communist agents when Indonesia was fighting mainland China inspired revolutionaries and fifth columnists in the fifties while trying to survive as a newly formed nation. Holland was taking "police action" in the outer islands to regain control of Indonesia soon after the war. China offered citizenship to Indonesian Chinese. Many left for the mainland. In 1955, dual nationality was abolished. In 1961, separate Chinese schools were shut down. The Chinese were asked to adopt Indonesian names and Chinese newspapers and periodicals were banned. Since President Suharto's assumption of power in 1965, the Chinese business community worked out a cozy relationship with the presidency and the military. The richest and most powerful businessmen are Suharto's cronies from the fifties. After 1969, children of Chinese descent could apply for and receive Indonesian nationality [9.6.5]. Relations with the People's Republic were normalized in 1990. Chinese businessmen have used their international connections and credit networks (guang-xi) to become the dominant business elite of today. They still feel politically vulnerable because of their low numbers and ethnic and cultural distinctiveness.

The community is very highly educated, excel in commerce and constitute a disproportionately large portion of the intelligentsia. They have advanced degrees from western universities and occupy influential advisory positions in think tanks.

**Legal Pluralism:**

It is only to be expected that over four centuries, the legal scene in Indonesia became a complex melange of various systems: Native Indonesian , Hindu, Islamic (Arabic) and Dutch.. In addition to the written law , customary law (adat) has existed for centuries. Unwritten adat rules are not uniform from one region to the next. According to the Dutch Scholar Van Vollenhoven, there are seventeen regional adat law groupings and even within a group there are variations although similarities within a group outnumber the differences. Adat law was ,by and large, ignored by the colonial rulers who partitioned the population into ethnic legal groups and imposed Dutch law as an extension of government power to divide and rule. Since independence, the legislative approach has been expedient rather than systematic. A systematic review was not done. New laws were promulgated as needed. It is, however, not entirely clear which code provision( that was in force at the time of independence) has been altered or repealed. This is because Indonesian legislation frequently does not identify what parts of the code are being changed by a new statute, but merely states that 'any earlier regulations contrary to the statute, are no longer in force' [9.6.6]. This leaves an inappropriate amount of room for interpretation. There is no authorized edition of the code in force today. Scholars, lawyers and the courts continue to debate which provisions are valid and which are not .

There is a variety of law questions that is encountered in daily legal life in Indonesia . These conflict of law problems are raised by the question of what law is applicable for when persons of different population groups enter into commercial transactions.
It should be pointed out that the principle of strict separation between the executive and the judicial branches of government does not exist in Indonesia. In ancient Java, the king was enjoined to think of his subjects as his extended family. This is an Asian way of thinking- an Eastern approach that permeates and modifies all social transactions, including law. The ruling elite assumed total responsibility and authority that rendered external control not only unnecessary but politically obtrusive. Father knows best was the dictum. The good of society mattered more than the rights of the individual .

The New Order does not appear to view the legal process as an autonomous institution because such independence proportionately diminishes and fragments the responsibilities and prerogatives of political leadership (and power) [9.6.18] . When Suharto was first consolidating his power, private lawyers were considered a threat along with the communists and Islamic fundamentalists. The legal system has been made subordinate to political and bureaucratic authority. Article 54(4) of Law 2/1986 in effect allowed 'supervisory authority over private attorneys for the sake of guiding and developing the (legal) profession. Measures can be taken against legal counsel who act, behave, conduct themselves, speak , or issue statements that indicate lack of respect for the law, statutes, public authority, the courts or their officials.' Only a few advocates have tested the limits of this decree to their disadvantage. Recent economic growth in the private sector has

created an emerging affluent middle class that chafes under authoritarian hand of the governing clique. The resulting tension cannot find an outlet because social change is not matched by a corresponding political change. The US continues to press Indonesia to allow free elections and to show more respect for human rights. Christian churches and missionary movements continue to seek access to the international press and media to highlight the conditions of the Christian minority and poor ethnic minorities .

It should be recalled that when the Dutch first came to Indonesia ,they ostensibly came to trade and to spread Christianity. The political and economic powers in Europe had other agendas which took over. Their superior organization and military might overran the fragmented Indonesian kingdoms who could not organize themselves to offer sufficient resistance. This could be one reason why the Government is extremely suspicious of 'foreign powers interfering in domestic issues.' This perspective is common with previously colonized societies and was the basis of the non-aligned movement which brought together such disparate countries such as India, Indonesia, Egypt and Yugoslavia. They saw themselves being drawn into the polarization caused by the superpowers after World War II and did not want to take either side. The so called North-South dialog between the poorer Asian and Latin American nations on one hand ( which number 135 and which is presently being led by Indonesia under the historical title of the Group of 77) , and the richer European nations and America on the other, has only recently given way to the principles of free trade. Trade, not aid, now fuels economic development. The break up of the former Soviet Union and the change in China after Chairman's Mao's

death have altered geopolitical realities . Globalization of business and the explosive growth in world trade have greatly underscored the need for better understanding of cultures and legal systems wherever the US conducts business around the world.

Legal Background

The number of private advocates in Indonesia imparts a feeling of scale. Indonesia has a population of about 200 million people ( about 20% less than the US). In mid 1960s, there were about 250 advocates (private lawyers) in the country. From 1971 to 1984 another 1075 registered. Many lawyers do not register but practice privately . It is estimated that there are 3000 legally trained professionals ( registered or not) in practice today[9.6.8]. Young people are beginning to enter the profession because of the opportunities created by the globalization of business.

Court System

There are five kinds of courts that hear cases:

*(a) Adat law courts* :These are traditional local village level hearings presided over by the local chief and village elders. It is based on customary unwritten rules of social conduct. These will be discussed . Although adat laws do not lend themselves to international commerce, they are important to our understanding of Indonesian society.

(b) *General Courts*: They handle all civil ( private and commercial) and criminal cases of individuals and corporations. There are no commercial tribunals. Cases are first

brought in the first instance before the daily courts. If the judgment is appealed, it goes to the courts of the second instance. These appellate courts are located in the capital cities of the twenty seven provinces. The Supreme Court is the highest body in the administration of Justice in Indonesia. It is collegial with three judges presiding. Some interesting legal facts: In 1963 ,the Supreme Court issued Circular Letter #3 which empowered a married woman to undertake independent legal action and appear in court without the assistance of her husband. Men of Islamic faith are permitted up to four wives by their religion, but the law requires that they cannot indulge in polygamy without prior consent of the first wife. The loser in a litigation is expected to pay all court costs. Each litigant pays their own counsel. Foreign judgments of a commercial nature are not enforceable in Indonesia. They cannot be executed by Indonesian courts. The principle of territorial sovereignty is invoked. In this regard the Indonesian legislature has been rather rigid. No permit is given to enforce foreign judgments even within certain defined limits. The action may be brought anew before judges in Indonesia for retrial. If the parties have agreed to submit to the jurisdiction of a foreign court by way of voluntary submission or choice of law in private international relations, an Indonesian court will, as a rule, consider it a contractual obligation of the parties to comply with the judgment of the court involved provided it is in accord with Indonesian public policy. Indonesian courts do recognize foreign judgments of declarative or constitute nature such as divorce, nullity of marriage etc. Accounting books and balance sheets have to be retained for thirty years! Accounts in Arabic and Chinese scripts are not acceptable. They have to be in Roman script with

Arabic ( Western) numerals. The government discourages dialog with individual businesses. It prefers to deal with trade associations. Foreign businesses are not free to sell directly to consumers . They have to establish a local presence or go through agents or distributors. There are no foreign exchange currency restrictions as such today.

( c) *Religious courts*: Islamic litigants and defendants prefer to use these when social disputes arise, especially those related to marriage and inheritance. Islam does not recognize any boundaries between law , religion and the state.

( d) *Military courts*: Infractions by members of the armed services are handled here. While Indonesia is ostensibly a democracy, it is well known that the military has a firm grip on the country. Military officers occupy the highest political positions in the land. Because sporadic violence erupts from time to time because of the ethnic tensions, regional disparities and political frustrations and has to be controlled, the army is brought in to crush opposition. Invariably there are excesses on both sides and these human right violations by army personnel are tried in military courts. This has been resented by many politicians who have been denied what they feel is their day in court (literally). It should be noted that members of the armed services are not entitled to a vote in political elections! When we recall that many military officers are appointed to powerful government positions, it raises questions in some people's minds whether these individuals are 'untouchable' by law since military courts tend to take a different view and are not bound

to the same extent by the requirements of evidence and due process. [Hollywood has played on this theme in the context of American military courts in movies such as Caine Mutiny and A Few Good Men.].

(e) *Government Administrative and Land Reform Courts*. Unlike the US, Indonesian government is much more intrusive in daily life. It comes from the somewhat Confucian approach to the responsibility of the government towards its "subjects".

Adat Law incorporates a body of values and their observance which governs the way of life of closed rural agricultural societies in Indonesia and has emerged from the people's conception of mankind and the world. It is their path of life arising from their sense of ethics [9.6.11]. There is no distinction between real and personal rights. This means that, for instance, when a dispute arises as to title, the judge ( village chief) does not examine the nature of the right but the equities of the particular situation. The judgment will depend on the evaluation of the circumstances and the hardship caused to the parties . No distinction between movable and immovable property. Instead, Adat draws a line between Land ( the source of nourishment, the abode of spirits) and everything else. It characterizes, houses, furniture, trees, livestock as part of the land package. Land ownership is a collective issue, not an individual one.

No distinction between public and private law. Land sales are a matter of public law since the vital interests of the community are intimately affected by the use of the land.No distinction is made between civil and criminal law. The crime is seen to have ' upset the

community's equilibrium' and the village chief's response will seek to restore the community's lost balance. Contracts are formed when delivery of goods are made or when money (price) has been paid for the good or service. Verbal or written agreements are only considered intentions. Acceptance of a small advance constitutes a contract. Traditional kinship rules regulate which marriages are forbidden. It recognizes matrilineal as well as patrilineal societies and their attendant rules of inheritance and division of property.

Arbitration is not an adat concept. Disputes are settled by local village tribunals, which in practice always strongly recommend a peaceful settlement or compromise so that the need for arbitration is not keenly felt. It is common in Indonesia today to assume that native Indonesians engaged in international commerce have voluntarily submitted themselves to civil and commercial codes by entering the Western sphere of law regulating urban commerce.

Legal information that is useful to those interested in conducting business in Indonesia

The 1938 version of the commercial code generally governs the conduct of trade and commerce. This code is based on the 1848 Dutch civil and commercial codes which became the Indonesian Civil code of 1848. There are three different types of commercial partnerships :

(a) Perseroan: ( Reference: Book III Title 8). This is akin to the professional association that we see preferred by doctors, lawyers, consultants etc. in the US. It is 'a contract

whereby two or more persons agree to contribute something together, to carry on a business together, in order to share in the profits accruing from the common effort.' The partners can continue to use their own names. One partner cannot bind another without an explicit power of attorney.

(b) The Firma: (Reference: Title III, Section 2). This form is preferred by trading and service companies. Business is conducted under a common trade name. It can have property separate from the partners. In that sense it is closer to the limited liability corporation in the US.

(c) Limited Partnership: This form allows silent partners to invest money and reap rewards or share losses without actively participating in the management of the business. His ( or her) liability is limited to the invested capital.

Limited Liability Companies ( Reference: Articles 36-56 of the Commercial Code) .The Indonesian name for this is Perseroan Terbatas (P.T.) .The guiding commercial code articles are over a hundred years old and have been much amended and supplemented. On March 7, 1995, President Suharto signed into law 1/1995 which governs PTs. It has 129 articles and took effect on March 7, 1996. The old articles of the commercial code are still essential for gaining an understanding of the intent of the current law. Although the overall intent has been to facilitate international business and trade, many implementing laws have yet to be passed to enable the theory to be translated into practice. This "reform" or cleanup was motivated with the increasing interdependence of Indonesia on world trade . Clearly ,the 150 year old articles could not address modern conditions.

Some salient articles: Article 58 requires that annual statements be drawn up in accordance with The Financial Accountancy Standard. This is particularly valuable for foreign businesses and investors who are seeking minimum disclosure and transparency standards. Article 125, para 2. Stipulates that 'all P.T.s will have to conform to the new law by March 7, 1998 even if they were incorporated under earlier laws.'

Foreign Capital Investment The Government is aware that foreign capital, management expertise and technology are necessary for economic growth and development. It recognizes the scarcity of these within its borders. Foreign capital investment is governed by Law #1/1967 (Foreign Investment Law, FIL) as amended by Law #11/1970 . The following assurances are provided:

(a) Ability to transfer dividends which are paid out of after-tax profits and are attributed to foreign -owned shares in the original currency of the invested capital and at the current (prevailing) exchange rate.

(b) Transfer of funds to pay costs relating to the employment of foreign personnel in Indonesia.

(c) Remittance of loan interest and principal.

(d) Repatriation of capital arising from the sale of equity to Indonesian citizens.

(e) Transfer of compensation received from the Government.

Following the passage of Regulation 20/1994 on May 19,1994 , the government investment review board ( BKPM) has permitted 100% foreign ownership in most industries and has opened the way to joint ventures between foreign companies and state

enterprises in previously banned industries such as electrical power (generation, transmission and distribution), telecommunications, shipping, airlines, railways, drinking water and nuclear power. Caution must be exercised before entering a joint venture with the Government. Dissolution from the investor's side is not as easy as the formation. Major foreign investments in Indonesia are personally reviewed by the President! A one-stop approval process has streamlined the process so that multiple approvals from ministries ( who do not talk to each other and are jealously competitive) are not required. Where there used to be a 'positive list' of industries open to foreigners, now the approach is to create a specific 'negative list'. Any industry not on the negative list is open for foreign investment. Negative list industries are felt to be those that are sensitive to national security and sovereignty issues The deregulation has lifted most requirements for domestic equity and joint ventures. Those who opt for 100% initial ownership are required to divest some shares ( as little as 1%) over 15 years. This can be done through the stock market [9.6.9, 10].

Up to November 7 1997, the government logistics agency (BULOG) was the sole importer of "essential commodities" such as rice, flour, edible oils and sugar. As part of the concessions to the IMF in return for a $40 billion bailout package, the government has agreed to allow commercial importation of all these commodities , except rice. It would be a mistake to just think that these commodities are no different than the others. Distribution systems and the laws relating to them are still tied to the government monopoly.

Joint Ventures between Foreign Parties and the Government

In many areas of business, the government has decided that the particular sector is 'strategic'. In plain language that means that the government does not want to let control go to foreign interests. Oil exploration and refining is one of them. Arms/ordinance is another. Colonial experiences and efforts by internal political fractions- at times aided and abetted by outside interests - to break up the country have a lot to do with the apparent paranoia of security and the importance of strategic industries. The stability and confidence of the ruling elite has also a lot to do with it. In such cases, the government enters into ventures with multi-national companies where capital, technology, management skills and access to materials and markets are crucial. The legal constructs that support such an enterprise is known as the PERSERO.

The PERSERO (Reference Law # 9/1969 )

This is a limited liability company which is partially or wholly owned by the government. It is subject to the same laws that apply to commercial limited liability companies. This may lead a newcomer to Indonesia to think that it behaves like any other company; but because part of its capitalization is provided by the state, its management is highly influenced by government policy. Although not stated in the statute, the Director appointed by the government of such enterprises is appointed by and reports to the Minister under whose purview the PERSERO is classified. The PERSERO has at least two government

shareholders- the Minister and the Director. One of the first acts of the Director after the formation of the venture is to give to the Minister his shareholder's rights. Foreign Joint Venture Partners need to be aware of cultural 'traditions' of this sort. Even though a PERSERO may be ostensibly set up as a "for profit" company, it is kept on a very short politically motivated leash. For wholly owned PERSEROs this may not be an issue, but in the case of international Joint Ventures, it is a very important fact to be aware of. If the government owns preference or cumulative preference shares, the situation is even more tilted in favor of the government.

The procedure for establishing such a JV requires notarized articles of association and publication in the government gazette ( Federal Register) by the Minister of Justice The Minister of Justice has the power to dissolve ( liquidate) any P.T company. It would be very difficult to appeal and reverse this decision. (Reference Law 1/1995).

Dispute Resolution

*Mediation :* This is by far the most effective way of settling disagreements. In Indonesia, as in much of SE Asia. Litigation signals a failure of social relationships. The foreigner may win the case but all future business relations with that party and his network will have to be foregone.

*Arbitration* ( Reference: Title 1 Book III of the Code of Civil Procedure) : Arbitration is a Western concept Family disputes such as separation, divorce and the partition of joint property are excluded from arbitration.. Any Indonesian businessman choosing arbitration

has voluntarily subjected himself ( or herself) to European based civil law. The judge in Indonesia is likely to treat the articles in the statute as guidelines; he is not bound to the text. Although a draft of a new arbitration law has been drafted, it is to be inserted in the draft law on civil law which is also under preparation by the Indonesian Institute for National Legal Development. Foreign arbitral awards are not enforceable in Indonesia. Therefore Indonesia should be chosen as the site for arbitration. The Badan Arbitrase Nasional Indonesia (BANI) rules can be employed or other recommended wording such as the ICC (Paris) or UNCITRAL arbitration rules may be chosen. Only when arbitration fails , should foreign entities consider litigation as a last resort. The time involved is lengthy and the outcome quite uncertain because of the political influence over the judiciary and the lack of experience by judges in commercial matters, particularly international transactions. Labor arbitration is an established process. Indonesia has ratified the International Convention for the Settlement of Investment Disputes (ICSID) vide Law 5/1968. The choice of arbitral rules needs to be in writing and contained in a document signed by both parties.

Contract Law ( Book III of the Civil Code- The Law of Obligations)

An interesting byline- The law of obligation states that it is the duty of a son or daughter to support his/her parents if they become impoverished ( solves the social security problem in one fell swoop!). Four elements are required to establish a contract: consent of parties, capacity to contract, lawful purpose and determinable subject. Consent must be voluntary- obtained without duress, fraud or mistakes. Duress can be physical or mental.

Mistakes can be due to confusion as to identity of persons or the subject matter of the contract. Fraud is an overt act by one of the parties , prior to the formation of the agreement, with the intent to deceive, to induce the party to enter into the contract which he would not have done otherwise.

(a) Capacity to contract :Minors and people under guardianship excepting, individuals and legal commercial entities can enter into contracts.

(b) Lawful purpose: Any contract that is in contradiction to public policy and good morals or violates the law is not considered valid.

(c) Definite Subject: The precision of the language in commercial contracts is important. The subject matter can be goods or services whether in existence or to be produced or provided. There is no requirement for reciprocity- a person may obligate himself to another without obtaining anything in return. Article (1444-1445 of the Civil Code) states that if the goods which are the object of a contract are damaged beyond repair, are lost, or perish, and the seller himself is not responsible for this loss or disappearance, he is discharged from his obligation to deliver.

Intellectual Property Law

Indonesia's economic growth can be described as surpassing the extent of its intellectual property protection . Indonesia is signatory to the Trade Related Aspects of Intellectual Property Rights(TRIPS) that was incorporated in the Uruguay Round of the General Agreement on Trade and Tariffs(GATT). Enforcement, not legislation is the problem.

Widespread piracy of software has caused considerable loss of income to US companies. Microsoft opened a Jakarta office in 1966 and is actively pursuing violators. Indonesia along with many Asian countries has a very different attitude towards pharmaceuticals. It does not consider the vast amount of money that companies spend on research and development. testing, clinical trials and legal approvals. All it sees is that Western companies have medicine that is potent and effective and that they are charging several hundred times the cost of the raw materials. Most Asians cannot afford these prices. The pharmaceutical formulations are not difficult for Indonesian drug companies to reproduce . Since can be a matter of life and death, society feels it is morally acceptable to challenge the very basis of patent protection of pharmaceuticals. Another fact that roils the Asians is that many medicines have been locally used for centuries. They never bothered to patent them- it not an Eastern concept. Now here comes ( what they characterize as ) a mercenary opportunist who not only claims that he 'invented' this medicine, but demands that the Asian pay them royalty every time he or she uses it. Most medicines are made from plants which grow in tropical climates. The indigenous people of Indonesia have a very highly developed sense of plant medicine . Many pharmacy companies send scientists to them, learn from them and then patent their knowledge in the US as well as Indonesia. Certain tribes have shown immunity to diseases possibly due to their DNA genetic structure. This DNA fragment has been patented in the US. This has caused much hard feeling. An "Indonesian was patented without his or her knowledge or consent!"

Trademark Law , TML ( Reference: Law #19/1992 dated August 28,1991, effective April1,1993 and Regulation #24/1993 on classifications of goods for mark registration) : Registration is the basis of protection. Without registration there is no protection. The first to register in good faith receives entitlement. The Registry now has a more active role in that it has to perform substantive examination before accepting registration. This , hopefully, will give more assurance to applicant. Service marks such as certification or company marks are also handled by the new law. Cultural mores dictate what marks are contradictory to good morals and public policy or order. For example nude pictures or photographic representation of God or the Islamic Prophet are unacceptable. Names and pictures of famous people , flags, weapons, state names and symbols and abbreviations of national or international institutions also cannot be registered as trade marks. Indonesia is becoming sensitive to international opinion about piracy and its detrimental effect on its trade. Article 44 governs the licensing of trade marks. An essential requirement is that the TM should be sufficiently distinctive and should not violate good morals and public policy . The initial registration is valid for ten years ( article 7). Extension for a further ten years are permitted if application is made twelve to six months prior to the expiration( article 36).

Patent Law ( Reference Law #6/1989 dated November 1,1989 effective August 1, 1991): A patent must be new, inventive and industrially applicable. An inventor has the rights to his patent. The first to file is recognized as the inventor unless proven otherwise.

*This is different than in the US where the first to invent usually ends up with the patent rights.* Patents are valid for 14 years from the date of receipt of the complete application (articles 33-39). A two year extension can be granted if an application is made between 12 to 6 months prior to the expiration date provided evidence of continued and sufficient use is presented. Patents have to be worked or they are lost. If the invention is not implemented in 48 months the patent can be canceled ( articles 94,95). Foreigners must submit patent applications through a local patent consultant as proxy ( article 28). License agreements must be registered. Indonesia subscribes to the principle of compulsory licensing. Articles 81-87 state that if the patent holder has not commercially implemented his patent and a third party is financially and technically capable of implementing it on a scale beneficial to society at large, then a compulsory license can be granted and compensation paid to the patent holder.

Copyright Law ( Reference Law # 6/1982 and amending Law # 7/1987):
Computer programs, adaptations and compilations are expressly protected for 25 years. So are photographic works. Original and derivative works such as books, records, art works ( batiks) , musical performances, books, maps, lectures, dances, and architectural works are protected for 50 years.

Foreign works receive protection if they are first published in Indonesia or if bilateral or multilateral treaties to which Indonesia is a signatory. The US and Indonesia signed such

a treaty on August 1,1989 based on the principle of reciprocity and covers all copyright matters. Infractions can result in fines and a maximum jail sentence of seven years. Registration is not required for copyright protection, but it creates a presumption of ownership- however, this is subject to rebuttal. If a protected creation has not been translated into Indonesian or reproduced in Indonesia within three years of its publication, the government may, in the interests of education, science and research subject the work to compulsory licensing.

In Conclusion

The legal complications that can arise in international transactions with Indonesia due to its membership in the Association of South East Asian Nations ( ASEAN -of which it is a founding member) , the World Trade Organization(WTO) and the World Intellectual Property Organization (WIPO) has not been explored. SE Asia is moving towards an ASEAN Free Trade Area ( AFTA- an acronym of an acronym!). There are many agreements that have been concluded in matters of preferential trade concessions that impinge on trade in goods and services. These overlays are not very explicit and further complicate an already complex legal situation. The WTO is still in its formative stages and has not replaced GATT(S) in many areas of substantive law. It does not have the case histories to fall back on- but it is a vision that is taking shape.

*Local Legal Counsel*: There are surface similarities to US laws, but a review some of the major issues that could cause a foreign business person to come to the wrong legal decision is useful:

(1) The basis of Indonesian law is different. It is not the British-American system. In fact there is legal pluralism that pervades all aspects of the system. Islam being the overall religious ethos , the boundaries between religion, society and the state are blurred. The commercial courts are relatively immune to this. It creates social dysfunctions even when 'internationally appropriate' decisions are handed down by the courts. Implementation may take years.

(2) The legal system is much more an arm of the political/executive power structure than in the US. Although a nominal democracy, it is 'franchised' by the military . The government is involved in every activity.

(3) The language of the land is not English . Bahasa Indonesia is the native tongue of the minority of the citizens and the educated elite. Legal material in English is relatively scarce-though this is changing. Translations are poor vehicles for legal analysis, especially when languages have embedded cultural values that do not translate well and are interpreted differently by different subcultures in the society.

(4) Regional disparities, ethnic and religious diversity mean that past court decisions in one province are not a good bell-weather of current judicial thinking locally.

(5) Rightly or wrongly, Indonesia has acquired a reputation as a country which is free-wheeling. Wide spread corruption, cronyism and lack of implementation of existing laws have undermined confidence in the legal system. It is felt that high ranking officials with a military background are treated very preferentially.

This is not to suggest that all is lost. US businesses cannot just ignore the fourth most populous nation on earth. There is a need to understand the Indonesian legal system better, their culture better and celebrate the differences. It is futile to try to impose the US legal system on Indonesia. That would be making the same mistake the Dutch made for over three centuries. Times have changed. The US has a tradition of lending a hand to other less fortunate nations so that they can become its trading partners. A workable legal framework is an essential component of such an economic and business climate.

**Section 3.9: Organizational and Operational Considerations ( How Organizational Structure and Company Culture Affect International Technology Transfer)**

While it is clear that there are many mechanisms for technology transfer, viz. licensing, strategic alliances, foreign direct investment and joint ventures, the complexity of the relationship increases as one moves from licensing to joint ventures. By examining the situation where an American company is planning to transfer technology to a SE Asian company via a joint venture most factors that need to be considered will have been touched on.

Joint ventures occupy a niche in business growth strategy. They require less financial and management resources than outright ownership but more so than licensing. Complementary capabilities and matching agendas make these forms attractive . International joint ventures require careful preparation. For this discussion, a joint venture will be taken to mean a business arrangement where one or more US companies agree to pool some of their resources ( capital, management skills, labor and intellectual property) with one or more Asian businesses with the intention of pursuing medium and long term

common objectives ( years , not months) in a South East Asian country. This venture may or may not have a separate legal or business identity, but the direction will be charted by the US and Asian partners.

Motivation

US Partner: The assumption will be made that the US company is the one with the Technology and managerial skills and desires to expand in South East Asia to grow its revenue from the emerging market there. It is already known that cheap untrained labor is a factor for the short term. As foreign markets open up to international competition, labor costs will rise rapidly and narrow the wage gap advantage that historically attracted labor intensive operations to Asia.. Trained manpower is another matter. Many companies have found that technical and management skills at international levels are hard to find, and when grown by a company, quickly leave when competitors hire away the best. At the managerial level, familiarity with US business practices is a scarce commodity.

Access to natural resources are a powerful motivator. It is not a coincidence that the earliest multi-nationals were oil and mining companies. Timber, rubber, spices, tea and coffee are also traditionally associated with overseas operations. Modern industry, however, is viewing the huge local market demand as a resource and is assessing the consumers, supply and distribution chains as attractions. If one throws in improved logistics, tariff side-stepping and possibly reduced non-tariff barriers due to perceived local participation, one gets a strong pull exerted . US companies are increasingly facing

maturity in home markets. One can often derive from this the conclusion that the US has limited growth and slim profit margins. This provides the push. When companies see that the competition is moving into a market, there is a feeling that diverse operations will give the competition a strategic advantage that may be long lived and expensive to overcome. Recall that AT&T pulled out of the China market and now is going back in. IBM is back in India but does not enjoy the dominance it once had. Companies do not want to be shut out . Some countries such as Malaysia offer special advantages to companies that achieve 'pioneer status'.

Asians do not easily forget when they think that some one believes in them and is willing to take a chance on them . CE makes it a big point in their print ads to state that they are the first in markets . Joint ventures are one way of easing into a foreign market without risking large capital investments. The Asian partner's willingness to invest indicates that there is local validity to perceived opportunities. With the right Asian partner, a US company can get a navigator that knows the political and legal system and the culture/ language and business customs . If the local partner is well connected politically, financially and commercially, it greatly improves the probability of success, compresses the time to come on-line and can provide limited business insurance if the going gets rough . ( Local union labor negotiation is an example). *It is difficult to overstate the importance of the choice of a local partner*. In these ventures, the US company also learns learn from the local competitors, suppliers, distributors as well as the Asian partner. These benefits are real but hard to quantify. Foreign operations do open up opportunities

for gains in the stream of revenues in the future if the local currency appreciates relative to the US dollar. Hedging, currency options and other financial management techniques can protect from unwanted non-systematic risk and exposure . A political/social benefit of joint ventures is the sentiment that can be generated that the US company is a "resident alien" in the host country and a "good citizen" . This proves useful when there is rising nationalistic sentiment in bad or uncertain economic times that result in rising unemployment.

Asian Partner : In general, Asian companies like to form joint ventures with US companies. They find Americans straightforward, inclusive, trusting, hardworking and business like. What one sees is more-or-less what one gets. The US does not have a history of colonialism. The US lifestyle is what Asians are trying to emulate. US managers and expatriates not only perform but play and party as well. Americans bring no class consciousness or other baggage to the relationship. They are confident and openly pursue gain and profit. The US has a deserved reputation for high technology and managerial skills. The Asian partner is looking for quality assurance and equity to help create a reputable product. US brand equity is high in South East Asia and ,because of its international reputation, can command a price in the premium market segment . Access to the US market is highly prized.

Joint Ventures with US companies is regarded as prestigious and, in some cases , a counter to the present pervasive economic presence of Japan in Asia. Painful memories

or World War II still exist . Some governments do not wish to put all their economic eggs in the Japanese basket. The Asian partner also hopes to transfer US technology to their location and benefit by the R&D that goes on in the US company. There is risk sharing in the venture that is attractive to Asian partners. They also hope to use the US company's local embassy connections to ease up on potential domestic political pressure in some cases. The author's personal experiences in Nepal in the sixties are relevant. The British Embassy Commercial attaché and USAID Director helped shield us from pressure from the Nepal Government during the contract execution of a radio station build operate and transfer (BOT) project that my company had undertaken with a local partner.

2. Strategy and Agendas

Companies can be thought of as two distinct types; those that maximize shareholder wealth and those that maximize corporate wealth. The first type issue a steady high stream of quarterly dividends and are dear to institutional investors. Wall street rewards them by valuating their stocks based on the price to earnings ratio. Top management compensation is heavily dependent on stock price. The strategy here is to keep showing profits every quarter. This has a powerful effect on many decisions. The second type seeks long term growth and is willing to forego short term profit taking by re-investment of dividends and using retained earnings for long term gain.

At the risk of stereotyping, the US marketplace encourages the first type and the Japanese marketplace the second type. Japanese stocks are valued at 45 to 50 times earnings. A factor of three separates the criteria of the New York and Tokyo stock exchanges. Macro-economic policies exert a strong influence . In the US, businesses want the government to stay out of their operations; the government is prone to watch carefully from the sidelines and does not intervene unless there is a likelihood of public outcry or unacceptable political fallout. In Asia, the Government is much more involved in the affairs of businesses. It is intrusive at times and behaves as an uninvited third partner. Selected industry sectors are restricted , and international joint ventures may need to be registered if not reviewed and/or approved depending on the industry sector and political sensitivity. In Indonesia ,for example, the government frowns upon 100% ownership in the oil and petroleum industry.

The nature of overseas operations of US companies exhibits a wide variation. On one extreme we have the screw-driver factory or offshore factory with minimal local discretion and control over its destiny. Even Canada chafes under the perception of being talked about as a US branch plant economy. At the other end of the scale, there is the lead plant role . The example of Hewlett Packard in Singapore comes to mind : all ink jet printers produced by HP for world-wide use are now produced in Singapore. All product development and most of the directed research for the product line is now done there. The US partner is very likely to take a pragmatic approach based on economic indicators, commercial intelligence and personal experience. It is important

that the US company recognize that the Asian company in a joint venture probably *expects* to eventually perform a lead function even if no promises were made or implied. If there is no such likely hood in the horizon, it may be painful in the short run but some openness is called for from both sides in private discussions early on in the relationship.

Within Asia there are at least three models of company strategy in existence. To oversimplify, the Koreans seek growth above all , the Japanese seek market share and the US companies seek profits. This is a natural progression in the scheme of things. Joint venture partners need to develop an instinctive feel about these underlying and often unspoken assumptions about their respective realities.

Size, Nature and Age of Business

Size can be thought of in terms of capitalization or number of employees or sales volume or number of locations. Age of a company also can be different. It may have been around a long time in one business but may be entering a new field or international setting. Its age may be a function of its executives or its board of directors.

Age and size do have a tendency to increase a company's inertia and its propensity to take risks. This is modified to a large extent by the nature of the industry and the pace at which technology is changing in that industry. Gateway Computers is more nimble

than IBM. Oil and gas and mining companies have historically dealt with large risks . Global automobile companies are required to take large calculated risks. The stated investment objectives when raising share capital has a lot to do with the company's freedom to take risks. Young companies in high growth fast changing environments have to take risks and make decisions on very limited information. Ownership of the company also exerts a strong influence on the risk stance of companies. Family owned or controlled companies tend to take on the personality of the major shareholder . The extent of control is influenced by how closely the voting stocks are held . In some cases, owners prefer professional mangers to run the day to day operations. In other instances, owners or their designates micro-manage daily operations. Many major investors feel that they need to do this to protect their investment. They do not fully trust the managers technically or commercially. Some do not do so because they do not hire, train or retain the best because their compensation policies do not attract top notch talent.

The flexibility of a company, its ability and willingness to change is a function of the rate of change in the industry at large. For instance , liquor companies pride themselves on their traditions and unchanged processes for centuries. The comfort and sense of history that the customers derive from this is touted as an advantage.

In the personal computer field, the products change constantly. Computer companies are therefore much more adaptable than others. When joint venture partners have very different abilities to flex or move, care has to be taken to see that the rate of change in the industry can be kept up with.

Asian government organizations and Non-Government Organizations also enter into joint ventures with US companies. These organizations have distinct characteristics and technology transfer has to match such an environment.

When choosing partners for Asian operations, US companies should consider the 'personality profile' of the partner. This is not to suggest that there has to be total compatibility.

4. Management styles

Much has been written about management styles such as MacGregor's theory X and theory Y and the Japanese theory Z of consensus building. Management students are exposed to the Taylor's scientific method ( time and motion studies etc), the systems approach and the human approach .In joint ventures one can have these different systems in operation at the same time in different departments. It takes enormous insight, patience and flexibility to deal with situations where clashing management styles can grind down an otherwise successful business enterprise.

A common characteristic of US companies that continue to thrive in Asian markets is that they have empathy for the local population. They share the national aspirations of the host country and believe that together they can grow the pie and the slices will be bigger for every one. They do not seek to exploit the situation unfairly for short term situational gains. This is not to suggest that businesses are altruistic at their core. The point is that a joint venture has to offer benefits to both sides. Those companies that can not only tolerate diversity ,but actually feel comfortable with and actually enjoy different cultural flavors , fare a whole lot better. Such companies are open to new ideas, approaches and methods and are willing to try them based on the merits of the case.

5. Political

Politics is an ever present backdrop against which business activities are played out. Much of what encountered today is a result of history. One cannot overlook the fact that much of SE Asia was once under colonial rule. Then Japan overran most of it during World War II. Some bad experiences with greedy multinationals and the struggle for independence has had deep and long lasting effects on the national psyche. Many US businesses are critical of the political regimes that they encounter in South East Asia. There are powerful presidents, Communist Governments (Vietnam) and regimes that are in transition (to put it mildly). Before forming joint ventures in such locations, US companies need to examine their comfort level with the situation. Quite often the democratic values that Americans cherish are not available to the host population.

Some US businesses feel compelled to rectify the situation. As a joint venture partner, businesses need to ask themselves to what extent they are willing to participate in local political reform .

The local partner may be under instructions to maximize employment rather than profits ( to fulfill political agendas and obligations) . In countries such as Indonesia there are undercurrents of ethnic strife, minority inequality ,cronyism and corruption that need to be navigated with dexterity. Human rights are linked in the minds of the US government and many US companies with MFN status and international trade. The rights of workers to unionize and collectively bargain enter into the picture.

US companies should not forget that by linking with a particular Asian partner they are automatically buying into a political camp. That may be advantageous. The next election, however, may put the Asian partner totally out of favor. In the US ,election risk is very much dampened by the strict separation between the judicial and executive branches of government, a well developed body of statutory and customary law, the freedom guaranteed to individuals and an appellate process. In Asia, election results can swing political fortunes very drastically and rapidly.

International trade is changing rapidly partly because of regional trading areas being formed. Although the Association of South East Asian Nations(ASEAN) is twenty five years old, the Asia Free Trade Area (AFTA) is recent and is committed to reduction of

trade barriers by the year 2004. It promotes intra member trade much like NAFTA. The Asia Pacific Economic Cooperation(APEC) initiative was started November 1993 and is trying to geopolitically integrate most major countries with Pacific coastlines. US companies with intentions in South East Asia have to be alert to the implications of these regional developments on their business. In Asian countries, the state 'guides' capitalistic and free market oriented economies. US companies unfamiliar with the region are likely to assume free market principles that may not exist in their US form.

5. Financial

US companies are used to very much more financial disclosure mandated by the Security and Exchange Commission . Accounting practices mandated by the Financial Accounting Standards Board (FASB) via FASB 52 (4) and by wide availability of credit history information. In Asia, the financial status of a potential partner company is much more difficult to assess quantitatively and objectively. A lot more is done by trust and reputation. The local embassy can help in the screening of potential joint venture partners. The American Chamber of Commerce and private conversations with experienced expatriates in informal non-business settings are valuable sources of business background information.

Relative financial strength is relevant. If a small US business joins with a local Asian giant, the relationship can be somewhat one sided as far as decision making is concerned. US companies also should consider the tendency of potential partners to creative

accounting practices. When earnings from the foreign venture, such as royalties, are based on performance indices such as sales or profitability, then US partner revenues ride on the ease of verification of business records.

6.Legal

There has been considerable ink dedicated to the issue of intellectual property protection of US companies in Asian markets. The joint venture arrangement underscores the needs even further. The situation leads to a more sharing than either a licensing/franchising operation or a directly owned subsidiary. In joint ventures the inadvertent disclosure may occur in the natural course of supplier interaction. The Asian partner may not have non-disclosure agreements with all its key employees. The concept of giving information on a need to know basis is quite foreign ( no pun intended) to many companies. US companies should consider a formal review of US and Asian practices with their partners. This is much room for misunderstandings. US companies need to understand that patents are protected by legal statutes but know how and trade secrets are not covered adequately by laws. They need to be covered by contracts between the two parties.

US legal contracts tend to lengthy and comprehensive and cover most eventualities of disagreement. This is the nature of our legal system. Asian businesses view legal recourse as a means to patching up a business relationship failure. Asians tend to write contracts that are high in intent and low in specifics. The words one hears are 'all this is understood and customary'. This is a difficult area for US joint venture partners and reliable local

counsel is a an absolute requirement before anything is agreed to, let alone signed. If discussed with tact and forthrightness a lot of heartburn can be avoided. Three minimum areas of dispute resolution that have to be put on the table early on in the game are: the choice and language of law, the forum and jurisdiction of choice and whether mediation and arbitration will proceed and how and in preference to litigation.

It is wiser to contact the US Department of Commerce before signing joint venture agreements in the areas of high technology. Microprocessors and software are so ubiquitous that military importance and national security can easily invoked by the competition, if not the government. The use of complex encryption codes is an example of such a technology. A clearance or license can be obtained for the technology for the specific country. The US has different standards for countries depending upon whether they are friendly or neutral or hostile. For example, the government would carefully scrutinize efforts to form joint ventures with parties in North Korea!

When joint venture agreements have run their course, the US company may have created a potential competitor. Some US companies are regretting licensing their technology to Japan in the sixties and seventies. Ex joint partners may wish to export the products to third markets where the US wants to continue to sell US made products. The Asian partner may make unauthorized revisions to the product or technology sometimes in the guise of making the product more suitable to local conditions.

Asian products may find their way back (trickle back) to the US by resellers as gray market goods or parallel imports. These issues should be considered by US companies when selecting Asian partners. Past history is probably the only indicator available.

Cultural issues

In the US, individuals tend to play different roles at work and at home. Home life is separated from working life. Business is business ; bosses and subordinates use first names on golf courses and picnics. That may not preclude a firing a few days later. Values in the work place are quite formal in large corporations. America is the freest and the most generous of societies , but American corporations can be cold and calculating. Witness the phenomenal popularity of Dilbert cartoons. In Asia, Confucian, Hindu, Islamic and Buddhist values are not checked in the foyer or factory entrance as work starts. The supervisor- manager is expected to be benevolent and the employee expected to be obedient and watching out for the supervisor.

American get to business discussions very early in the relationship. Personal friendship is not a pre-requisite for doing business. Personal feelings are not permitted to get in the way. In Asia, business is conducted on a personal basis. A lot of ritual and relationship building and comfort creation goes on before deals are made. The contract is not the end of all discussions. Parties are expected to give and take a lot more as events unfold . The negotiations are not over till the final payment changes hands in the contract fulfillment.

To oversimplify: Americans tend to be deal driven, the Asians tend to be relationship driven. When a contract is signed, Americans say they have closed a deal; the Japanese say they have opened a relationship!

Outward behavior is different in the East. Asians may choose to live with their parents, men may hug each other in public, women may speak with lowered eyes and in softer tones and walk a step behind their spouses. US businesses should not evaluate potential business partners on cultural factors alone such as avoidance of eye contact or a limp handshake. It is an unfortunate common practice to measure others using our cultural yardstick. Humility, courtesy and politeness is mistaken for weakness and timidity.

8.Others

Technical and commercial competence of the Asian partner are extremely important. The most valuable assets that a company has are its intellectual property and its reputation. US companies need to be very sensitive to the quality of the products of its joint venture operations in Asia. Several US companies have started out with joint ventures and then bought out the interests of the partner . Poor quality and image have been the more common complaints. It is much more difficult to maintain quality under very different operating conditions. If there is very little vertical integration and the venture is somewhere in the middle of the chain, the challenges are great.

Companies such as Porsche, Mercedes Benz and IBM avoid joint ventures. Small niche players with high technology or segmented markets also are not inclined to form Joint Ventures. Michelin, high end Swiss watchmakers are examples.

Joint venture identity is another aspect. Kia motors of Korea made the Ford Festiva for years. Korean companies did not mind hitching a ride on the reputation of a famous MNE. It was a strategy for survival and early growth. Toyota, Mazda and other Japanese companies strenuously avoided a blurring and potential loss of identity. Mitsubishi motors was identified with Chrysler for a long time ; only recently has it broken away and projected itself separately. Johnson Controls paired up with Yokogawa to make instrumentation recorders. It was Johnson-Yokogawa for a long time. Now it is just Yokogawa ; Johnson is no longer in that business. How many remember Cannon's relationship with Bell and Howell or JVC ( Japan Victor Corporation) and RCA.?

Training is an issue with regard to Joint Ventures that US companies need to budget for. This is often under estimated ; the start up time and costs of joint ventures is sensitive to the training required for both partners. We have talked about joint ventures as though they were "green field " projects, that is that both partners are starting something new. It happens often enough that a partner is brought in at a later reason for strategic reasons discussed earlier. In such cases, the urgency for this kind of review increases and the time available is considerably less.

In SE Asia, the government, the armed services and non-government organizations entities enter into joint ventures with US companies. They have unique management attributes that need to be considered in technology transfer situations.One of the more important decisions a US company needs to make is the selection of the person who will look after their interests in the joint venture. The person assigned reflects the importance attached to the venture by top management.

Disadvantages

If things start to unravel, partners are likely to start disagreeing over anything and everything. These include equitable sharing of risks and profits, sourcing of components materials and choice of suppliers, prices of US components paid to the US partner, royalty payments, management style, selection retention and compensation of key management personnel and investment and re-investment policy. Joint ventures do take a lot of management talent to set up and run. They tend to take what opponents claim is a disproportionate amount of top management time. There is a danger of loss of technology, image and reputation. There is a possibility of creating a formidable competitor.

10.Conclusions

International Joint Ventures are fascinating. They flourish where other arrangements are impractical or inefficient. Like good marriages, they are sometimes made in heaven and

most other times benefit from both parties deciding that they are going to make it work , no matter what. We have examined some of the factors that partners or matchmakers should consider.

The jury is still out on the success and failure criteria. Research is going on in the US (University of Colorado; Dr. Manuel Serapio for instance) on the subject. Real life material is hard to come by. Most companies are close mouthed about their failures. It is natural and all too easy to blame the other partner or on circumstances deemed to be beyond the company's control or lack of appreciation by top management. As the competition heats up in international business, the margin for error in joint ventures is going to be significantly reduced.

## Section 3.10 : Financial Considerations

While technology transfer is not normally investment intensive and is not concerned with capital goods, international technology transfer has unique characteristics that make an awareness of financial fundamentals highly desirable for technology providers. When technology is introduced to a region, the benefits may be distributed over a large number of people, but the costs may be borne by relatively few. For example, if a Japanese or German company invests in a new automobile plant in the south to produce cheaper and better cars ( by some measure), then the US consumer will benefit. The resulting possible layoffs or reduced shifts in Michigan will be felt strongly in the local economy of a few towns.

America has historically been sustained by a large domestic economy. While the world knows it as a dominant business player, the percentage of the domestic economy that is export oriented, used to around 15% as opposed to about 50% for Japan and Britain. This is changing as business become more global. The fact remains that even a quarter of the US economy represents a significant part of world trade. US trade in services is substantial and the US media apparatus overseas give it a powerful influence which irks its competitors . CNN, The Wall Street Journal and the New York Times are powerful

influences. While recognizing that the US economy is not paramount anymore ( as it was in the fifties and the sixties), the US dollar is still the reserve currency of many countries and is the functional currency of several industries such as oil and gas and the airlines. Several countries have pegged their currency to the US dollar. For technology providers, some financial familiarity is a must. While law may help companies to recover the situation when things go wrong, knowledge of international finance will help companies make the most of any situation.

In the eighties, US companies had difficulty in getting their profits or investment out of many countries because those currencies were not freely convertible, or the real rates were far different from the official rates. These soft currencies required countertrade and counterpurchase agreements which are relatively rare today but still not unknown. More and more countries are becoming business oriented and are trying to allow their currencies to be traded in international markets.

Taxation rates used to be very different in many countries. A consequence was that multinationals would resort to transfer pricing to move profits and revenues to more tax favorable locations. This is slowly going away as governments realize that to attract investments they have to be realistic and be attractive. Taxation rates are slowly converging.

In the US, the amount of financial disclosure required is quite remarkable and is

unmatched in the world. As a result, when US businessmen go abroad, they are surprised when much of the information, that they take for granted here, is not available there. This makes it difficult to make informed decisions. Coupled with the fact that accounting practices are not standardized , it makes estimation of activity based accounts receivable, such as royalty payments due, hard to estimate or confirm.

Capital markets are truly global and efficient today. Very large blocks of money can be made to flow around the globe almost instantaneously. Countries such as Malaysia and Indonesia are feeling the downside of this. Electronic commerce is fast commerce. The options that a modern financial executive must consider in the international business scene are varied and complex. The financial instruments available are daunting to non-financial businessmen. There are many interest rates depending on the source. Real interest rates are adjusted for inflation and are based on underlying fundamentals- productivity and the foregoing of present day consumption for a future date. This varies from country to country. As capital markets become increasingly open, capital flows take advantage of this 'interest arbitrage' opportunity till it becomes unattractive to do so. Ignoring risk for the moment, real rates can only be changed by productivity changes and/or the propensity for current consumption.

The management of risk is second nature to financial people. Political risk insurance is not under discussion here, though there are government organizations, such as the Overseas Private Investment Corporation, that underwrite special forms of insurance. A notion that

may appear non-intuitive at first is that, because world markets and currencies are poorly correlated, appropriate diversification (by establishing operations simultaneously) in such markets actually reduces risk. Individually, such operations may look risky, but overall risk is reduced by this 'diversified portfolio' approach. Ford's European and North American operations were not correlated and profit cycles peaked at different times evening out the fluctuations.

*Political risks* are of varied kinds. Legal risk is discussed in sections 3.16 and 3.18. Host countries use tariffs and non-tariff barriers to protect their own industries and for tactical advantage. The US has been pushing for freer trade . Non-tariff barriers are more intractable and more despised by free market proponents because the true effects are hard to quantify.. In many older, larger and more diverse countries, regional differences are very large. Technology providers unfamiliar with the cultural landscape may make the mistake of assuming that their experience in one region will stand them in good stead in another region. Countries such as Indonesia. India and China are more likely to trip the unwary foreigner!

Change in leadership is a well recognized political risk. The current situation in India and Indonesia makes investors who are not already in the market, pause and hold off on major commitments.

*Accounting risks* that we need to be aware of are translational risk and accounting

practices risk. In the first, how we convert and when we convert the revenue from foreign operations into our annual company bottom line makes a big difference to the perception of return on investment in the minds of senior management. US accounting as per the Financial Accounting Standards Board (FASB) is by no means universal in the world. Differing approaches to allocations of costs, expenses, overheads etc. can completely change the perceptions about the financial health of an overseas operation. One cannot be in denial of creative accounting and its many variations that are the products of fertile and devious minds everywhere.

*Economic risk* can come from foreign competitors and from foreign exchange risk due to fluctuating rates. Real exchange rates are nominal exchange rates adjusted for the changes in purchasing power. There are several ways of coping with exchange risk. One technique is to manufacture high elasticity of demand products (price sensitive) locally and to export low elasticity of demand products (price insensitive) from the US. Japanese auto makers, for example, make Toyota Corollas and Honda Civics here, but import Lexus models and Accura Legends from Japan. A short term solution to reducing exchange risk is to employ one or more hedging techniques. Companies that are interested in concentrating on their core business may be better off covering their exposure in this manner. Financially resourceful companies, such as multinational enterprises can use currency swaps for long term exchange risk management. Exchange risk can be avoided if payments can be arranged in US dollars. This is not always possible. If the other side agrees to it , they may build a margin into the price to cover the risk. Risk can be shared by arranging the

contract in a way that, if the foreign exchange rate fluctuates within a band , there is no

change in the terms of the contract. If the exchange rate goes outside the range, then a pre-arranged formula of compensation will be followed- of course, this has to be done before the fact.

In the short term, exchange rates respond to a host of stimuli, including speculative attacks by big traders. In the long term, foreign exchange rates move because of relative productivity gains, relative inflation, monetary supply ( relative to productivity increase), political stability, government participation in the economy, government fiscal (taxation) policy, and chronic surplus or deficit in the current account and capital account . This is a very long list and underscores the argument that most companies do not wish to be involved in exchange risk, but would want to take financial precautions for covering their exposure by creating a matching offset of the expected position of their foreign operations.

Financial executives who invest heavily overseas sometimes use planned dis-investment as a way of risk management. They review contingencies that would lead them to fold their operations overseas and take their investment out. This involves assigning probabilities to scenarios and the costs associated with each and estimating the best overall strategy. Technical people do not think in this fashion, but as more and more knowledge intensive companies venture overseas, the intangible portion of total investment is increasing, and

plans to pull out should also include an assessment of this component.

If joint venture is the vehicle for international expansion, the partner should bring to the endeavor, in addition to local political, legal and market navigational skills , connections to capital markets and the financial community.

## Section 3.11 A Knowledge Perspective for Assessment of Intangible Business Wealth Such as Technology.

Technology transfer is one strategic option in technology management. What is the technology of a company worth? Technology is capability, process and product. It is worth looking at a comprehensive intellectual framework for estimating this form of wealth. As the US moves away from being an industrial society to a knowledge based society, business organizations that are seeing the most rapid growth are knowledge intensive. When one compares their stock value to their financial assets one sees that there is a huge gap. What is the reason that hard nosed stock analysts give for the market to book ratio (which can be as high as ten?). The answer 'future revenue streams', dodges the question at best because the question then becomes ' On what basis was the future stream based if not on the book value?' In his new book 'The New Organizational Wealth'[9.5.9], author Karl Erik Sveiby explores the reasons and some implications for business managers.

A Knowledge Perspective

Knowledge has a peculiar quality. It does not diminish when it is shared. It can gain currency and can grow or become refined by its distribution. It is a premise of education.

The economics of knowledge intensive companies is, therefore, unlike that of companies that trade in tangible goods. Conventional financial and accounting asset evaluation does not explain the total worth of such companies. These measures are suited to industrial era companies. When companies are bought and sold, the difference between their book value and their traded value is a gross measure of their intangible assets. We use concepts such as good will and market share to analyze the discrepancy. Karl Sveiby recommends a new paradigm he calls 'knowledge perspective' for evaluating the intangible part of organizational wealth. He divides intangible wealth into three categories he calls competence, internal structures and external structures.

By competence, he means the sum total of the individual capability of the employees of the company: their education, their years in the industry, the years with the company, and their esprit de corps. By internal structure he means the intellectual property, models, computer simulations, computer and administrative systems, corporate knowledge and corporate culture. In external structure he includes relationships with the suppliers, brand equity, the number and quality of the clients, customer satisfaction, reputation and image.

Employees are considered assets. Their salaries and benefits may be costs, their surroundings and support structures may be accounted as overheads. Time and money spent in education and training of employees should be considered investments, not costs.

Discussion

Intangible assets may be invisible but they can be sensed by their effects. In measurement and control theory, indirect or surrogate variables are used to estimate the variables that one cannot directly measure or control. Entropy is an example from thermodynamics. Sveiby does not mention concepts such as demand chain relationships, credit worthiness, social capital, corporate memory and management competence, but they have to be included.

New measures or indices are not hard to conceive. The results are hard to interpret and lack the widespread recognition and acceptance that give any measure its value and influence. Efforts have been made to displace SAT scores, the Dow Jones Index, IQ and other measures, but their history of data, verification of interpretations and widespread use give them a status and legitimacy which frustrates and infuriates avant-garde thinkers . Acceptance gets very close to becoming objectivity. The success of any knowledge intensive enterprise depends on all three types of intangible wealth. In marketing awareness is increasing of the importance of demand chain management [9.3.1] .

*Social capital* is a concept that has been in development for over a decade. It has been described as 'potential intangible wealth that accrues from networking, reciprocity and trust'. Social capital has structural, relational and cognitive dimensions. Structural aspects

are network density, connectivity and hierarchy. Relational aspects are trust, norms, sanctions, obligations, expectation and identification. Cognitive aspects are shared understanding, interpretations and systems of meaning between parties through shared knowledge, code and narrative [9.7.9].

Networking can be both internal and external to the company and is primarily a form of horizontal communications. It can be formal or informal. Networking builds contacts which can lead to interaction and eventually trust [9.7.3].

Trust is a key ingredient and has an efficiency aspect to it. It reduces time and effort spent in background checks, in supervision and in verifying the work of those who are trusted. Trust grows with time and shared experiences. Homogeneity, empathy and self assurance help it along. In his book 'Trust', Rand Corporation social scientist Fukuyama credits trust with the American characteristic of 'spontaneous sociability'[9.2.48]. In addition to rugged individualism, Americans have had a tradition of trust and community that has enabled them to create and function within organizations quickly and effectively.

Frederick Taylor's industrial organization was based on low trust and has been modified recently in industrial organizations. To make the most use of a knowledge society, Americans will have to get back to relationships based on trust.

Technology takes the shape of society around it. It is not intended as a compensation for human relationships. Lack of trust may prevent society from reaping all the benefits that it can derive from a technology. When the internet was a network of trusting scientists, there were no security concerns, hackers, pornographers etc. Now the situation is changing. Reciprocity is based on a recognition of mutual need, shared objectives and long term relationships. Social capital is an individual based measure and therefore would be better placed under the competence category of intangible wealth.

Technology is part of the intellectual capital of a company. It has to be protected and deployed as it best serves its stake holders. Products and processes of technology would fall under internal structures. Capability in a technology would fall under competence as would knowledge creation and innovative capability. Technology transfer would fall under external structures. The market for technology is an imperfect one for reasons identified in section 1.2.2. A knowledge perspective stimulates a company's thinking and can help it estimate its wealth that is due to its technology.

## Section 3. 12: Culture Specific Concepts of Space

A discussion of the use of space in different cultures under two settings is presented: the general availability of space and social interpersonal relations, and the implications for businesses.

1. General

Countries such as the United States and Australia are large, with vast open spaces still available for travel leisure, recreation or future expansion. Farms tend to be large. Home sizes and lots, cars and other artifacts are not restrained by a general shortage of space. Countries like Japan, Singapore and Holland on the other hand have very limited land per capita and land use tends to be intensive and relatively efficient. In Japan, space is at a premium. It is carefully used. Rooms in homes are furnished in ways to maximize utilization and to serve multiple functions depending on the time of day or occasion. Sliding doors and futons are examples of artifacts that reflect available space.

Golf courses are a luxury and personal gardens are highly prized personal meditation spots. Airports, buses and trains tend to be crowded. The Japanese have learned to be in close proximity with others and have developed courtesy, cleanliness and social

mannerisms to cope with the situation. They are not unique in this, but they exemplify the trend. The Japanese have commercially exploited their ability to miniaturize in very many areas such of electronic packaging, compact wall mounted quiet room air conditioners etc.

It is interesting to note the conditions under which people feel claustrophobic depends on the culture as well as the discipline that people have been trained to accept. Sailors in submarines, miners and astronauts have accepted the confines of their restricted space. People in harsh winter climates tend to build smaller homes because of heating requirements. Incidentally, they also build tighter, stronger and more functional homes because of the long winter months spent indoors . The Scandinavians are a good example. In warm climates, people tend to spill out of their homes on the streets. There is more interaction, watching and being watched becomes a social pastime . Homes tend to be less well built and functional ; the emphasis tends to shift to decor and style.

Space and privacy are intimately linked. Americans need their 'personal space' for intimacy, reflection and restful relaxation and sleep. People build walls, fences, screens and structures to partition space for different purposes. How much privacy one needs or wants is very culturally influenced. It is related to one's perception as to whether one is an individual or a part of a group. American children get used to their own bedroom from a very young age.

These preferences are developed at the very early formative stages of life. Most children in India and China are generally very uncomfortable sleeping alone in a room because they are not used to it.

People from different cultures react differently to large and small places differently . It should not be assumed that everybody from a crowded background would automatically prefer more spacious surroundings. What may seem spacious and comfortable to one may seem empty and forbidding to others. Personal preferences, affluence and perceived social standing all come into play. Many immigrants to the US prefer the 'crowding' of some large cities over the openness of other places. They feel comfortable knowing that someone is close by, that they can socialize more easily and simply that is what they are used to .

Anthropologists have studied the effect of space, particularly distance, in social interactions among different cultures. This study is called proxemics. In his book 'The Hidden Dimension', Edward Hall identified four categories based on his study of middle class North-Americans[9.8.57]: (1) intimate distance- used for lovemaking, comforting and protecting. Smell and touch sensitivity is at its highest. (2) personal distance- depends on the relationship. This 'personal bubble' is the individuals comfort zone for conversations, standing around etc. (3) social distance- used by acquaintances, formal settings and classrooms. (4) public distance - the distance within which a decision needs to be made to recognize others or not. Subtle shades of voice inflection, gestures and facial

expression are lost. The physical distances corresponding to each one of these categories are culturally determined norms that are fairly predictable and consistent within a culture.

Implications for businesses

The implications for businesses are that factory, commercial and office layouts need to be reviewed for space requirements when designing for different cultures. Lifestyle products such as cars, domestic appliances and furniture and lifestyle public places such as restaurants, cinemas and amusement centers are space sensitive. What may be prestigious entrances to US offices or factories may be misunderstood as wasteful, inefficient or pretentious in other cultures.

Partitioning of space affects communications in business settings. Most architects and commercial planners tell us that. Cubicles are often provided in the US for reasons of privacy, ease of concentration or status. The Dilbert cartoon series pokes fun at our sensitivity in this area. Americans tend to leave our office doors open as a gesture of being approachable- the 'open door' idea. Germans tend to leave them closed because it considered business like. The Japanese tend to have open floor plans with desks close together to facilitate and promote discussion. In the old days, this arrangement was disparagingly called a bull pen in the US.

Proxemics are important in intercultural settings. For normal conversations, Americans prefer distances between a foot to two depending on the person, the situation and the

subject matter- twenty inches being fairly commonplace. In Latin America and the Caribbean 14 to 15 inches is quite common, whereas in Arabic countries, 9 to 10 inches is more common. One can visualize an American backing off every time a Saudi Arabian approaches him because he is 'being crowded' , only to have the Saudi come closer again. The American may think the Saudi to be aggressive or overbearing. The Saudi may think the American is trying to avoid him or being stand offish. Meetings and parties are situations where different proxemics can cause misunderstandings. In different cultures there are 'respectful distances' that are understood. When people of different hierarchy walk around or assemble as groups, subtle messages of power-distance are being sent and received. All this is part of the non verbal communication process. The more astute and culturally sensitive person picks up on these cues and avoids misunderstandings and embarrassment.

One reacts to space at a subconscious level most of the time . When norms are challenged individuals become uncomfortable. Often they know why, at other times they cannot pinpoint the cause. In the CAMPS matrix formulation, the concept of space is categorized as a shared assumption cultural variable.

**Section 3.13: Culture Specific Concepts of Time:**

Time is a necessary measure of all human activity since it is used to give us a universal reference for life's experiences. It allows us to relate to change in a manner that we can discuss with others . Time, cause and effect and space are the big three areas that philosophers love to discuss. In 1976, social philosopher Edward Hall popularized the terms 'monochronic' time and 'polychronic' time to describe two fundamentally different ways of thinking about time [9.2.46].

1. Time is Polychronic (P)

This is the perennial view of time. Ancient societies observed natural phenomena such as musical notes and rhythms, heart and pulse beats, sunrises and sunsets, circadian rhythms, sleep cycles, the phases of the moon, tides, ovulation in women, the seasons, birth, aging and death. They concluded that nature has a rhythm as well as a cycle. The wheel of time is a pervasive Eastern metaphor. As hunting and foraging societies became increasingly agricultural, this concept grew even stronger. Personal and social events were charted in relation to natural cycles. Festivals, harvests and other events were linked to nature. A lunar calendar was developed. It was convenient; a clear night would confirm the phase of

the moon. In a P society, human relationships drive activities not the availability of time. Time is not a constraint, an intrusion, an enemy. It is a marker along life's journey. Friends use expressions such as 'see you at sundown'. This allows considerable flexibility. Delay and waiting does not cause tensions on either side. The process of disagreement resolution is more important than the speed. The duration of an activity is a natural outcome of the quality of the relationship; the process is more important.

In ancient times, education was considered complete when the teacher felt that the student was ready. Meal times stretched depending upon the company and the occasion. People ate when they were hungry or if there was someone to share a meal with. They slept when they were tired. They awoke around sunrise. This view was in harmony with small population groups, simple technology and family kinship linked to tribes and villages. People would stop travelling in inclement weather and at certain times of the year. Astronomers started linking the movement of heavenly bodies to social events and astrology was established. Fate, destiny and other beliefs got intertwined.
Even today, under the veneer of industrialization, many Asian societies are basically polychronic in their social outlook. India and Indonesia are examples. (Japan is a notable exception as a monochronic society in Asia).

2. Time is Monochronic (M) In the West, as maritime travel increased due to better propulsion technology and more advanced and reliable methods of navigation, the

need for better time-keeping arose. Ships, out on the open seas for long periods, had far fewer social references for long-term time determination.

As western societies became industrialized, it became more necessary to accurately track time. Slowly, but surely, time began to acquire an identity of its own and was assigned intrinsic value. The measure of time became linear and sequential as opposed to rhythmic and cyclical. The need for increasing precision is reflected in the progression of related technical artifacts: hour glasses to mechanical clocks to electronic clocks to satellite synchronized digital devices whose signals originate from an atomic clock in Colorado. Time measuring devices increasingly govern lives in M societies. Time is divided into hours, minutes and seconds; these have no relationship to natural cycles and is therefore a different system and independent of the bases of P societies. Time can be thought of as a hard currency in M societies and as soft currency in P societies. Common expressions in M societies such as 'time is money', 'time and tide wait for none' , ' time window' are indicative of this shared assumptions of an M society ( Table 1 in section 1 includes concept of time in the shared assumptions level of culture) .

Time management empowers P societies to become more productive, effective and affluent. It enables organizations to coordinate and synchronize large and complex processes and projects. Recall Frederick Taylor's time and motion study ( scientific school of management) and Henry Ford's assembly line operations. They were firmly rooted in the M time concept. Modern production techniques such as just-in -time exploit the

benefits of synchronization. In M societies, adherence to the clock allows for smooth functioning and is valued because it improves efficiency, performance and creates wealth. M societies tend to have fewer holidays and vacation days and 'personal days off'. There are hard deadlines that cause stress if they are missed. Many feel that there is little time 'to stop and smell the roses'. Spare time or leisure time is considered precious and is carefully planned and rationed. Expressions such as 'quality time' gain acceptance. Time related stress is felt simply because of the increasing pace of life.

Businessmen talk about 'getting to the bottom line' or 'cutting to the chase'. Conversations tend to be relatively brief and efficient. Drawn out negotiations are not favored. Long pregnant pauses during negotiations cause discomfort. Youthful energy is also reflected in the US social practice of shortening names, acronyms and getting to a first name basis very quickly. Multi-tasking is considered an asset because it saves time. ( this expression is itself M centered!)

3. Implications

When a person from a P society is thrust into an M society or vice versa, there is likely to be misunderstandings. For example, M societies value punctuality. It is considered considerate, courteous and efficient to be on time. It shows respect for the other person's (value of) time. When an M person is kept waiting, he or she may surmise that a message is being sent- that he or she is not important or unwanted. P societies take a much different view. Appointments are just intentions. If an earlier meeting lasts longer, that is

to be understood. If a dear person happens to stop by, one accommodates that. Accomplishments and achievements are not the only measure of success in P societies. The quality of personal relationships is very important. Business and social punctuality are handled differently in M and P societies.

Planes, trains, buses etc. are expected to run on time in M societies. Business hours are adhered to and often exceeded. Deliveries are expected to be made on time. An M person in a P societies may be frustrated by the apparent chaos- transportation timing may be unreliable, payments and goods may not show up on time. Government officials may not be available at times specified . Permits and licenses may not be granted in time, resulting in losses. In contrast to their home base, M expatriates in P societies may find their productivity to be low; hopefully the management recognizes these differences in the M society home office.

On the other hand, a P person in an M society may tend to feel the time pressure to be acute. The lack of flexibility may cause stress. Long hard work hours and the need for time planning and decisiveness could be difficult to adjust to. An P person may find personal relationships to be formal, correct but a little cool. He or she may perceive a lack of joy in people's lives. It is ironic that poorer agricultural P societies have much more quality time with their families and friends.

In a technology transfer environment , change management professionals can become more effective if they are aware of the two views of time and are mindful of the cultural

roots of the technology provider and the technology adopter. It will help in the understanding of the interaction of the incoming technology into a host society.

## Section 3.14: Indigenous Knowledge

1. Background:

The global loss of biodiversity, cultural diversity and ecological instability and degradation has given reasons for policy makers to pause and consider the research findings that are increasingly urging the integration of indigenous people, their rights and knowledge into development funding decisions. The term indigenous people itself is proving to be somewhat elusive, but we will accept the one chosen by the World Council of Indigenous People as ' population groups who from ancient times have inhabited the lands where they live, who are aware of having a character of their own, with social traditions and means of expression that are linked to the country inherited from their ancestors, with a language of their own, and having certain essential and unique characteristics which confer upon them the strong conviction of belonging to a people, who have an identity in themselves and should be thus regarded by others'.

Scientists use the term *Indigenous Knowledge Systems(IKS)* to describe the totality of information, practices and beliefs and philosophy that is unique to each indigenous culture. Such a system may be commonly held within a community or indigenous society, or it may be known only to specialists, tribal elders or lineage or gender groups.

The term *Traditional Ecological Knowledge(TEK)* describes those aspects of an IKS that are directly related to the management and conservation of the environment. TEK is a body of knowledge built by a group of people through generations living in close contact with the land. It includes a system of classification, a set of empirical observations about the local environment and a system of self-management that governs resource use [9.8.5].

2. Issues:

Top down unilateral development policies by organizations such as the World Bank have resulted in catastrophic results in the lives of indigenous people. It is now recognized that IKS has valuable contributions to make to medicinal knowledge, agricultural and plant diversity and environmental management. Yet the intellectual property rights of indigenous people are being violated or ignored and they are not receiving compensation for their loss.

3. Medicinal Knowledge:

Most of the 7,000 natural compounds used in modern medicine have been employed by traditional healers for centuries and 25% of American prescription drugs contain active ingredients derived from these plants. Ethno-pharmacology is the study of traditional medical practices to select plants; indigenous people have already identified the species of plants and where they grow. They know what parts are useful, how to gather them, prepare, store and administer the medicine.

Pharmaceutical companies learn these healing techniques, patent the medicine and reap huge profits while deriding the sources as 'unscientific folklore'. The market for plant based medicines was estimated at $43 billion in 1985 [9.8.4].

4. Environmental Management:

Indigenous people have managed their environment for centuries. Granted the intensity was low and low population densities may have allowed them to survive. More careful observations are showing very sophisticated strategies for resource management that is sustainable over the long haul. TEK may be optimized for local conditions , but the approaches show great promise for more general applications.

5. Agricultural Diversity has been enriched by IKS; the improved plant strains developed by traditional methods have been shown to more resistant to disease, pests and other environmental threats.

6. Legal Aspects:

The western approach to intellectual property is based on individual ownership and the capitalistic notion of profit derived from the market value set by supply and demand. However indigenous knowledge is ' trans-generational and communally shared.... Western laws cannot accommodate alternative systems of ownership, tenure and access'[9.8.5]. The current laws fail to protect indigenous people since it grants exclusive rights to individuals ( natural or corporate) and not to communities, since these are

difficult to define in the current western social context. The World Intellectual Property Organization (WIPO) and UNESCO are proposing model conventions to protect IKS. All it is talk at present .

7. Conclusion:

There is a lack of agreed upon protocol on method of investigating IKS and TEK. There is inequity in the sharing of the benefits(profits) between the bio-prospectors and the host societies. The laws do not protect indigenous rights. There are differences of opinion between those with IKS and TEK and their seekers as to what is significant and important [9.8.3]. Indigenous people have a great deal of difficulty with the approach that only that knowledge which is useful ( read of commercial value) is worth saving. They feel that local needs and value systems should decide what knowledge is worth passing on not current market conditions. They state that we do not know the future uses of many of nature's flora and fauna. TEK views humans as part of the natural environment, not apart from it in the role of consumer, observer and controller. Everything is tied by a delicate web of causation within nature. Development organizations such as the World Bank now recognize the value of preserving indigenous knowledge but are faced with obstacles in designing and implementing development projects that build upon IKS and TEK bases rather than build over them. Participation by indigenous people is difficult because of differing value systems and time horizons and their lack of clout partly due to their numbers, diversity and lack of a coherent voice.

The recent raising of the political profile of these issues will help in persuading policy makers to have a more open mind. The fundamental debate as to what should be legally required versus what is morally and ethically responsible is now in progress.

Postscript: On a personal note, a visit to a traditional wooden Malay house near Kuala Lumpur in February 1998 was fascinating. The house was built on stilts on a marshy site. I was surprised to see that the foundation posts were square into the soil and up to three feet up. It was round at higher elevations. I thought it was because of structural loading concerns and the better grip a square cross section might provide in the soil. On asking around I was told that 'everybody knows that a snake does not like to slither up a square post!' That is why the portion in close proximity to the ground is square. The rounded portion further up is for aesthetic reasons. It just needed some local knowledge!

## Section 3. 15: Business Kinship Among the Chinese in SE Asia

Background: The word Chinese is used indiscriminately in popular writing when referring to a genetic grouping, a cultural background or when discussing systems of philosophy such as Confucianism and Taoism. In the business and economic sphere of SE Asia, there is a wide spread belief that the Chinese control trade and commerce. It is estimated that there are between 43 to 50 million persons of Chinese heritage in the region and that, excluding Hong Kong and Taiwan, the 'funds' of the 'overseas Chinese' exceeds US $400 billion. In Indonesia, the Chinese number between 4 to 5 million ( about 2.8% of the population) , but control half the trade and three quarters of the private domestic capital. Similar figures are to be found in other countries of SE Asia[9.8.60]. In the case of Taiwan, Hong Kong and Singapore, these countries are populated largely by Chinese people; together they have foreign exchange reserves larger than either that of Japan or the United States. The Chinese have been called by one scholar ' the greatest diaspora in the world'. The purpose of this paper is not to discuss the wealth of the Chinese in South East Asia, but to examine some of the relationships that exist among the Chinese businessmen and traders. A detailed analysis of the situation of businessmen of Chinese heritage in Indonesia will also be presented.

When the Chinese first emigrated to SE Asia as workers, they found work in mines and isolated areas where locals did not want to go. These Chinese workers came from remote parts of China themselves, such as the Yunan province. Bonds of language, strong regional loyalty and trust because of home roots came to be known as gongsi or guanxi. What started out as a network slowly developed into a 'club' that had forward linkages (distribution) and backward linkages (financing). The Hakka rice distribution network in South Vietnam for example, was so strong that even the colonizing French were forced to deal with them [9.2.47].

The importance of Chinese networks still exist , but the relationships have undergone complex modern transformation[9.2.11]. Chinese businessmen linked up with Japanese, Korean and Western multinational businesses to become powerhouses and engines of growth development and staggering personal wealth [9.5.1]. International businesses are aware of the Chinese networks and factor them into their investment decisions in SE Asia. These networks have been crucial during the privatization of state run enterprises in Malaysia, Thailand and Indonesia over the last fifteen years.

2. Reasons for success

The historical explanation is that the Chinese had profited greatly from the middleman position that the Dutch and French colonists had forced them into. They implemented unpopular policy decisions of the colonists for money and economic power because they were simply not given access to political or military power. They used their amassed

wealth to run an informal but tightly controlled credit system for other Chinese businesses in SE Asia . They also had business experience over centuries of colonial rule. This gave them an enormous head start and advantage over local entrepreneurs.

The cultural explanation is that the Chinese are more tightly knit than other ethnic groups. The Chinese family structure resembles a model corporation: a long time horizon, value for education/training, respect for hierarchy and authority, responsibility towards the unit , courtesy towards members and a strong motivation to save money because of thousands of years of hardship and indifference by the rulers, even when they were in China.

3. The Situation in Indonesia:

The Chinese have been in Indonesia for centuries , long before colonial times; a small Chinese kingdom flourished in Kalimantan in 1777 and the Chinese revolted against the Dutch in 1740[9.8.59]. Trade between China and the rest of Asia had been going on for a thousand years. The Dutch colonials were responsible for transplanting a large number of Chinese in SE Asia. In the 1920s, six hundred thousand Chinese workers were brought into Indonesia [9.8.50]. The fact that these hardworking, thrifty people were willing to work for low salaries under harsh conditions, save and remain loyal to the colonials was a very attractive option. The Chinese were distinct enough, that if given some preferential treatment and told repeatedly that they were "culturally superior" to the natives , they could be easily persuaded to distance themselves from the local population and serve colonial interests. Given their highly developed food, language, manners and a refinement

that comes from centuries of evolution, the Chinese felt 'recognized' by the ruling European elite. The Dutch colonial government used the Chinese (along with the Indians and Arabs) to manage and manipulate the indigenous majority and to stay in power. This sowed the seeds of mistrust and latent hatred in the hearts of indigenous Indonesians. This is exactly the effect the Dutch Government wanted; to divide and rule. The Chinese were required by the Dutch masters to wear a long pigtail down their back, attend Chinese schools and live in a designated part of town. Their segregation was legislated [9.8.50]. The Chinese had a tradition of organization, record keeping and a sense of large central control because of the conditions existing in Imperial China for thousands of years. They readily adapted to their new middleman and buffer role assigned to them . They were not inducted into the military or given senior government positions. They were not permitted to own land. They flourished as traders, money lenders and professionals, accumulated wealth and excelled in the arts and in sports. The parallel to the Jews of Europe in the eighteenth and nineteenth centuries is striking.

The Chinese are not a homogeneous group. Overseas Chinese- the generic term used for this social unit- originate from many parts of China, many from south eastern China. They speak different dialects which are nor intelligible to each other. (The written script, being visual though, is understood by the literate, regardless of the dialect- the original graphical user interface ! ). When Chinese long term residents began to take on local names, started speaking the local language, started dressing like the locals and participating in local festivals, the distinctions got blurred. Such was the case of the *peranakan* of Indonesia

who were there to stay. They had no plans to return; some intermarried and were happy in the melting pot.. New Chinese immigrants maintained the ways of the motherland. These *totoks* were a distinct sub-group who were brash, used to hustling and not at all interested in assimilating. They had come as opportunists.

Since Indonesian independence, indigenous Indonesians have been sporadically targeting the Chinese because of their wealth and influence in the economic sphere and the cozy relationship that they cultivated with President Suharto. The Chinese were politically very vulnerable during the first twenty years of Indonesian independence. The Chinese did participate in the struggle for independence from the Dutch, but they were considered suspect when the fight turned against the communists, who supposedly were backed by mainland China. Citizenship was not automatic and for a while, almost half the two million Chinese were in a state of limbo. In 1960, when offered repatriation by China, 130,000 Chinese residents left Indonesia. In 1974, after anti-Chinese sentiment spilled over into open rioting in one part of Indonesia, the last of the exclusive Chinese schools were closed and the Chinese script was outlawed in public places. Chinese Indonesians were "encouraged" to take Indonesian sounding names.

Most of the big industrialists partnering Suharto's family in large profitable ventures today are of Chinese origin. Many Chinese professionals advise the President in professional and trade matters. The words of Edmund Leach in his book on Burma seems appropriate: " The population is culturally diverse and political organization is structurally

diverse. The variations of culture do not fit with variations in structure. The system of variation has no stability in time. What can be observed now is a momentary configuration of totality existing in a state of flux."[9.8.60] .

As a minority group, no matter how successful collectively, the Chinese must sense the social jealousy and political tension stemming from their unique situation. It is natural and normal that this fuse them together socially and economically. For many Chinese, their Chinese-ness is part of their identity which they are willing to preserve at high costs. It is a distinctiveness that is mixed with ethnic pride at the economic rise of Singapore, Taiwan and Hong Kong and the rise of the People's Republic of China as a military and economic power. The aura of the Chinese Connection- a link to worldwide contacts, capital and information- has its advantages. It can be used as a political device or as an artifice of defensive parochialism.

Traditionally, the Chinese have put a high premium on education. Because of their vulnerability, they have learned to be hardy and self reliant, to save a lot and to trust family and kin over strangers. Their extended family networks give them informal strategic alliances and access to "well established networks of credit, market information, domestic and international trading contacts which gives the larger ones the capacity to survive and even profit from business cycles. While the forms of these networks may be distinctly Chinese, their function is not". The traditional Chinese preference for personal relationships rather than reliance on impersonal market mechanisms is gradually changing.

There is ample evidence though that personal relationships still dominate, but modern information sources, the wide spectrum of skills and activities required by global operations cannot be handled by personal contacts alone anymore .

A relationship that was a creature of convenience was called 'cukong'. A Chinese businessman, who was a proven fund raiser was paired with a top government official ( usually army officer) who could provide protection and influence. The mutual benefits were obvious: President Suharto wanted to encourage investment, the military was chronically short of funds and the Chinese wanted powerful and influential patrons. The economic fortunes of the upper echelons became interwoven with those of Chinese businessmen. Integration or assimilation of the Chinese minority in Indonesia is called the "Chinese problem". The Muslim majority has a wide spectrum of 'politically correct solutions' to the problem that is presented in closed groups . Although similar situations exist in neighboring countries, the more tolerant Buddhist and Christian societies have won more converts than in Malaysia and Indonesia where the majority are Islamic. It has been suggested that this made it easier for the Chinese to blend into society gradually without being forced to give up their identity in one act to total commitment. An Aesop's fable comes to mind: The wind and the sun competed to see who was more powerful. They chose a spring traveler to prove their might. The wind blew hard: it only made the coat wearer clutch his coat harder. However, when the sun started to shine brightly, the coat wearer started to perspire and willingly took his coat off. The Indonesian elite are proud of their multicultural principles and non-sectarian political posture;

overt anti-Chinese behavior would be harmful in many ways. Nevertheless, the national identity cards that all Indonesians must carry has a code for identifying the bearer as Chinese.

More than ninety percent of the Chinese are Indonesian citizens and most young Chinese identify with the country. Intermarriages are becoming common. The low profile of the older Chinese businessmen is not being emulated by the new generation. They are more western in their outlook and run their businesses in the current international style and profile. The older generation is concerned that all this flash will attract attention and cause the old resentments and excesses to surface again.

Chinese response to the outside economic environment is highly adaptive and pragmatic; where it is advantageous to invoke the Chinese ethnic identification, cultural affinity or social organization or language for business purposes, it is done. Where co-operation with the locals is necessary, the Chinese component is selectively de-emphasized.

The question as to whether Chinese businessmen tend to stick to Chinese kinsmen is answered depending on how far along they are in their development. Early on in the career, there is some of that. As they become more and more successful, they turn to "outsiders". The fact that successful businessmen have more links with both insiders(kinsmen) and outsiders suggest that these links reflect their status than cause it. Those that access capital from kinsmen are already quite successful .

Relatively less influential and powerful businessmen may be forced to resort to Chinese lineage and village connections to jump start their progress. Social networking is not limited to the ethnic bases.

Reciprocity- giving in the expectation that one will ,sooner or later, receive something in return-is easily understood as confirmation of mutual trust. To give is to be generous and to believe that the other is worthy of help. When practiced as a business technique, it goes beyond kinship. Complex and profound ramifications can result for large exchanges, failures to meet obligations and to maintain loyalties. Character assessments are made; those who can work these effects to their advantage or to the disadvantage of competitors is a person to be reckoned with. Reciprocity and its associated networks are a way for a businessmen to put himself into an advantageous position . The building up of a reputation is used to create complex flows of information about possible deals, supplies, customers, and political events that may favorably affect trading conditions.

Great importance is placed on trust and personal relationships. Local contacts are friends and overseas contacts are often extended families or personal recommendations. Within these close circles there is close co-operation. Outside it there is cut throat competition. Although one could draw comparisons with the Japanese zaibatsu and keiretsu and the Korean chaebol, the nature is distinctly Chinese. The Chinese system of "competitive co-operation" is one designed to accommodate a large number of small scale, under

capitalized dealers and merchants and to provide them with a vertically integrated chain which is deliberately fragmented. This gives the many small dispersed merchants access to goods and makes them competitive with the non-Chinese because of their access to large inventories and willingness to operate on modest margins. It still leaves the big man in control of the distribution chain, information flow and market segment. This approach has worked well in Indonesia in the past because of the geography of the country: an archipelago of some 13,00 island spread across 3500 miles of the equator. Travel was hazardous and communications in the past was difficult at best, while banking and financial infrastructure practically non-existent.

Memberships in personal networking clubs such as the Rotary, Lions and the Kiwanis are today seen as a display of success, not as a means to it. It is not considered a forum for building a reputation. Unless a club has a good restaurant or golf course or swimming pool, other businessmen will have little or nothing to do with it. They are perceived often as forums for individuals whose sole aim is to promote their own social and political status. They are seen as useful as neutral meeting grounds for new appointees from overseas and upcoming government officials .

The individual features of Indonesian Chinese business kinship are not uniquely Indonesian nor uniquely Chinese. But when viewed collectively they do present an appearance, at first glance, that we are dealing with a monolithic social organization that is powerful, secret and exclusive where much back room political manipulation is

conducted. The Indonesian Chinese are somewhat different than the Hong Kong Chinese or the Thai Chinese or the Philippine Chinese. The Chinese sense these subtle differences among themselves. Those who live there or have studied them or deal with them also are aware of the differences. There is no denying though that there are similarities also which are useful as starting generalities. It is like Scottish Tartans. One starts looking at them and the more one sees, the more one becomes aware of the differences- but they are labeled as tartans.

The Chinese penchant for education extends to science and technology as well as business. In most technical undertaking in Malaysia, Thailand or Indonesia, one is likely to deal with Chinese professionals and managers with advanced degrees from some of the best universities of Asia, Australia, Europe and America. They are the most likely interface to technology providers. It helps to know the nature of Chinese business kinship if one is serious about success in that part of the world.

## Section 3.16: Ethical Legal and Social Issues in Technology Transfer

## Case of The Human Genome Project

1. Background

The Human Genome Project (HGP) was formulated in 1988 by the Office of Technology Assessment (The OTA has since been disbanded for lack of congressional funding). and an organization called the Human Genome Organization (HUGO). In 1990 the US Government ( Department of Energy and the National Institute of Health) funded a fifteen year, three billion dollar, research effort to completely map the human genome. Japan was the first to join the effort, followed by Canada, Britain and a few others. Mapping the human genome entails locating each gene on the DNA double helix and matching it to specific human characteristics. Every cell in the human body contains about 50,000 to 150,000 genes which combine to influence our individuality. Minute differences result in over six billion combinations. It seems that the genes are key to our understanding of the relationship between macro and micro characteristics. Mapping the genes will give those in the know, unprecedented power and influence Many medical conditions have been attributed to gene aberrations. Modern technology and information processing capability has made it possible to embark on this project. Between 1990 and 1995, the number of mapped genes increased from 1772 to 3695 [9.8.46] .

Genetics has been hailed as the new frontier in biological science and has stirred up not only the scientific community but all thinking, questioning, emotional, religious and philosophical groups in the world. *The Ethical, Legal and Social Issues (ELSI)* are taking on increasing importance and may well spawn the defining debate of the early twenty-first century. It will be extremely difficult for any group to sit on the sidelines: the implications are so powerful and pervasive. The genome project will force all of us to confront our value systems and the assumptions on which they are based- be they conscious or not. It brings to the fore the philosophical debates about ethics, morality, God and the purpose of the universe and our relationship to it. This seems to happen whenever science takes a sharp turn and reveals knowledge that outstrips our individual or collective ability to deal with it . Copernicus unleashed a storm in 1543 when he declared that the earth was not the center of the universe. Later, Charles Darwin challenged the literal interpretation of Genesis.. This happened in nuclear energy and space exploration. The military and commercial strategic advantages were so profound that money was thrown at scientists who were totally engrossed in unraveling the secrets of the universe. Scientists have been known to pursue knowledge for the sake of knowledge.( " To follow knowledge like a sinking star beyond the utmost bounds of human thought...." Lord Tennyson in Ulysses). Robert Oppenheimer , the leader of the Manhattan Project that built the first atomic bomb, later took his own life in part because of the guilt he felt for overruling the urgings

of fellow scientists such as Leo Szillard and Albert Einstein to stop the effort when Germany capitulated. Our intellect is not matched by our wisdom. It is as though our headlights are too dim for the speed at which we are driving.

Why ELSI?

What makes the HGP different from other previous efforts is the early recognition that the ELSI factor has to be addressed in parallel, not after the fact ,when dysfunction is intolerable. Three to five percent of the Department of Energy and the National Institute of Health budget for HGP is allocated to ELSI. Dr. Juengst of Penn State gave up teaching medical ethics to head up the ELSI project of the NIH in 1990 [9.8.47] . The ELSI bibliography [9.8.48] is huge; it contained 2600 publications in 1992! The work is just beginning [9.8.49,50]. The question has been raised: Why fund ELSI projects? There are critics who question this "largesse" to non-scientists [9.8.53]. Genetic knowledge affects decisions that individuals and families make about their future. They need to know the facts, what their rights are, what information is being collected about them, how they can get access to this information. They need to know what use is being made of this information and how it affects their employability, insurability and access to educational and social services. After a life spent in nuclear power, it seems that nuclear power plant technology is not flawed. The hype and overselling of it: "energy too cheap to meter" and the forced deployment of it without social participation, has been its undoing.

The lack of dialog and acceptance of the technology, the lack of political support and lack of a waste management strategy have ruined its chances. An ELSI effort early on probably would have changed its life cycle.

The US Patent and Trademarks Office began granting patents for genes in 1980. This outraged many scientists and ordinary citizens around the world. The fact that some of these genes were identified from the blood of indigenous people who had no idea that they were being "patented" , added greatly to the passion.! In June1991, the NIH Director at that time, Bernadine Healy approved pursuits of patents for sequencing processes and parts of identified genes (DNA fragments). This "threw the entire legal procedure into disarray... The head of the HGP resigned because the practice departed radically from customary scientific practice. Until then, scientists only sought patents for genes that were completely identified and whose function they clearly understood"[9.8.51]. To add fuel to the fire, the scientist heading up the sequencing work, resigned to join a private lab headed by a heath care venture capitalist specializing in the funding of medical research. It is a frenzy of patenting out there. There is a huge backlog of applications. Scientists are appalled and are saying that is not science, but a gold rush. The basis of a patent is an agreement between a government and an inventor, whereby the state grants the latter a monopoly for a fixed period in return for a full disclosure and written specification which is made available for free public use after the period is over. During the period of validity, the inventor has full and exclusive rights emanating from the patent. No one can use the invention without the inventor's consent and agreement as to the compensation for

working the patent [9.8.54]. The process is justified on the grounds that (1) it encourages disclosure,(2) encourages investment in research, production and marketing and (3) rewards innovation and allows for framework for industrial competition and technology transfer. A patent is not intended to curb bona fide research, only commercial exploitation. The lines can and do get blurred, however, and therein lies the rub.

This should not come as any surprise to social scientists and anthropologists. Motivations of scientists, lawyers, businessmen, politicians and the military are quite different. Each one has a different worldview and values the knowledge for different reasons and expects to apply it differently. Here are two quotes that highlight this . Oppenheimer testifying to the US Congress in 1945: 'When you come right down to it, the reason we did this job (the atom bomb) is because it was an organic necessity. If you are a scientist, you cannot stop such a thing. If you are a scientist, you believe that it is good to find out how the world works; that it is good to find what the realities are; that it is good to turn over to mankind at large the greatest possible power to control the world....'. Walter McDougall who headed the Apollo project had this to say: 'The moon was not what space was all about. It was about science, but mostly about spy satellites, and COMSATs, and other orbital systems for military and commercial advantage. ...it drew many nations into the hunt for advantage, not integration, through space flight.' [9.8.53].

It seems that today, once again, scientists are mesmerized by the opportunity to crack the mother of all codes. 'The fundamental and deeply held world view is a mechanistic and

reductionist one, which involves a systematic attempt to reduce biology to the laws of physics and chemistry; organism to program; behavior to genes, life to reproduction, and mind to matter'- sociologist Howard Kaye. The Human Genome Project provides an example (deja vu?) of how the reductionistic world view of molecular biology is suffused with a secular optimism.

There is deeply embedded expectation that science and technology will be our passport to the Garden of Eden. Our ability to foresee the future is no longer sought in our stars; it is sought in our genes.

2. The Issues:

2.1 Philosophical : At its most abstract, many individuals and groups object to delving into knowledge that they feel is best left unknown . They believe in respecting the mystery of life. Some feel that humans are not ready for this kind of power and responsibility. Others cite the sorry state of affairs in the past, when humans made a mess of the earth and the environment. Some feel that capitalism knows no limits and that we have to curb it . Everything and all information is not raw material for our use. They believe that our needs are limited but our greed is unlimited. There are also those that feel that we are tinkering with the sacred and that it is profane to do so. We have no right to "play god"[9.8.55]. We are advised to accept ourselves as we are, along with our imperfections. We are told that our individuality is our spiritual capital.

We have to learn to accept others as they are . There is no such thing as a perfect person-physically or mentally. Genetic engineering and genetic cleansing is felt to be immoral and against the wishes of the Creator.

2.2 Fears:

With any new knowledge comes a certain power. The genetic information and the ability to interpret it and manipulate the DNA make up of present and future generations has the potential to confer power of a kind only dreamt of, up to now. Scientifically lesser developed societies fear that this will be another form of colonization. Poorer groups suspect that the benefits will be reserved for the rich. Military men will suspect that enemies of the state will be coming up with novel and terrible ways to subvert their society and balance of power. Businessmen will feel that someone else will put them out of business. Lawyers will envision the need for new laws and politicians will be baffled by the new technology and ask for a blue ribbon advisory committee for recommendations so that they can ride the tiger, take credit for any successes and yet not be held accountable for any perceived or actual failures.

2.3 Information-related:

Who should collect genetic information? What information should be collected? How and on whose authority should it be collected? For what purpose? How and to whom can and should this information be disclosed? These issues are relevant to the large scale health/medical screening and testing programs that are possible and are discussed by

administrators, bureaucrats and policy makers. There are two principles which have been identified: autonomy and confidentiality. The first states that all screenings be voluntary and that consent is sought only full information concerning a positive finding is both understood and disclosed to the individual. Confidentiality requires that the finding not be disclosed to any one without the individual's consent. Recent American experiences with HIV testing has shown the need for better definition of the rules. When and how should genetic tests be introduced into medical practice? Pre-natal screening is one situation where this crops up. A related issue is how the information should be presented to a person being tested and who should present it.

How can confidentiality and privacy of a person's genetic information be preserved? A related issue is one of DNA or "gene" banks in which samples of a person's blood are preserved for future comparison and use. This is new in the sense that it is not a record of the past, but contains a partial future diary. Consent is needed before the sample is taken.

How can genetic discrimination by employers and insurers be prevented? How can the genome project alter our concepts of 'normal', 'disease' and 'genetic load or burden'? What are the implications of having an abnormal gene? What does it do to our prospect of marriage and parenting? What rights to we have as individuals and what responsibilities does that imply for us as members of a family and society?

2.4 Ownership: Who owns the results of the HGP? Who should benefit from patents arising from the research? Should it be in the public domain or should private researchers be able to patent genetic sequences?

2.5 Genetic Standards: The idea of preventing , or even more drastic, curtailing the life of 'imperfect' genetic humans is so repugnant to most that it is difficult to even discuss. The Nazi experience has not been forgotten. What is normal and who is to judge and on what basis and for what purpose? Already, in poorer societies where females are considered a burden, ultrasound traces are being used to abort female embryos.

2.6 Military Applications:

It would be difficult to conceive of any scientific endeavor for which the military does not see a ready application, either offensively or defensively. Military interest in recombinant DNA technology has been active since 1970. Vaccines against enemy germ warfare is one such use. Genetically manipulated toxins that are even more potent and can be remotely delivered is another area of interest. Failure to develop such products will not come from lack of trying. Some scientists even refuse to speculate in case they are taken seriously by military labs. The most common rationale offered is that genetic weapons are being developed by foreign governments and that we should do so for defensive purposes.

2.7 Genetic Engineering This subject can be divided into four categories: (1) correcting gene disorders within the body of a patient, (2) altering the genetic structure of a sperm or

reproductive organ of a human to correct disorders in the offspring, (3) enhancing certain characteristic(s) of a human such as height, complexion, color of eyes and (4) altering complex human characteristics such as personality, intelligence and character [9.8.56]. This last one is called eugenics and is the one that is the most emotionally charged. It, more than the others, underscores the assumption that biology is at the root of human traits and behavior. Depending on one's value system, these techniques are grounds for ethical concern.

2.8 Epilog/Editorial:

The assumptions that underpin the HDP need to examined. It is not self evident that humans are commodities. We are more than the sum of our biological parts. We have a physical aspect, a mental one, an emotional one, an intuitive one and a spiritual dimension. To base our actions on an incomplete model is inadvisable at best and potentially dangerous. Mapping our genes will tell us a lot, but far from everything. When scientists started to model the atom , they felt that they would completely understand the physical universe. Then came Heisenberg with the uncertainty principle and Quantum mechanics. The world became probabilistic not deterministic. The same is true of genetics. Our genes can indicate potentialities and possibilities not certainties. It can be, at best, a genetic horoscope. It may say that one has a tendency; that does not mean that it is inevitable. It renews the age old debate of destiny versus human endeavor. The Talmud contains a story of an Arab king who asked his artist to capture the likeness of Moses. The portrait was shocking; it showed a most earthy face.

When the king saw Moses, he was amazed; the prophet's face was not saintly. He approached Moses who said; ' I was born that way; that is not what I chose to become.' If science chooses to go it alone, staying aloof or above society, not engaging in meaningful dialog, it may yet again lose another great opportunity to serve society as a member. Science has no way of dealing with unknown unknowns. Wisdom is needed to temper intelligence. Keeping the ethical legal and social issues in mind is one way to avoid excesses and bad judgment.

This Human Genome Project highlights the interaction between technology and society. One can see interactions at the artifact , behavior, assumptions and beliefs level. One can see interactions across many attribute groups. This technology should be used with great forethought and if transferred at all, should be very maturely done.

## Section 3.17: Corruption As an Impediment to Technology Transfer

Corruption is difficult to define. It is social environment sensitive and its manifestations depend on the society in which it is rooted. Its social threshold changes with social acceptance which in turn moves with the times. Discussion is not going to center on whether corruption is increasing in an absolute sense or whether our awareness of it is more acute and our tolerance of it is decreasing. Such debates have been inconclusive and have not offered up any prescriptions or viable policy options. Neither are we going to probe how we can come up with policies for battling this scourge. Limited successes have been achieved by Hong Kong and Singapore [ 9.8.25 and 26 note: It is interesting that both these Chinese societies are tiny islands that came out of British colonization and have a distinct Victorian character ingrained in their senior civil servants]. Every society has to grapple with designing its own system of integrity. A holistic approach has to be developed and implemented from the inside, it cannot be applied from the outside. We are just going to look at the nature of corruption, discuss why it is not studied, examine some root causes and then familiarize ourselves with its propensity to subvert the tech transfer process. This should help us when we face our dragon in the field.

1. The nature of corruption

Societies have wrestled with corruption from time immemorial . Like racism, it is a cancer in the body politic that has proven extremely difficult to remove. Corruption exists in capitalistic, communist, and socialist societies as well as in military dictatorships and tribal societies. Islamic leaders in Iran blamed the corruption of the Shah's regime on capitalism, the Soviet communists blamed it on the Czar and many incoming administrations blame it on the previous one! Most communist countries make it difficult for bosses to amass a fortune and stash it away in a Swiss bank, but most right wing dictators like to have one for their retirement, which is one reason why subjects grow keen for them to retire. Corruption has flourished in Hindu, Confucian, Christian, Islamic societies and in every variation of religious allegiance. There is no unique high moral ground.

'The processes of corruption are rarely studied because exact evidence is generally unavailable and societies are so various that it is not possible to make exact comparisons. ...corruption is contagious; it breeds on itself; once established, it is inhumanly difficult to remove. But unless a nation collectively wants to die, it must, once corruption has settled in, grapple with the problem or perish'. [pp. viii, 9.8.29]. 'Like illness, corruption will always be with us. But as this sad fact does not keep us from attempting to reduce disease, neither should it paralyze efforts to reduce corruption. Corruption involves questions of degree. Countries and agencies have more and less corruption and various kinds of illicit behavior are more and less harmful. We can do better in controlling corruption' [pp.7,

9.8.28]. Legal scholar, John T. Noonan , wrote a book in which he concluded that bribery in universally condemned and is considered shameful. 'Every country in the world treats bribery as a crime. No one advertises that he can arrange a bribe. An innate fear of being considered disgusting restrains briber and bribee from parading their exchange. ...significantly, it is often the Westerner with ethnocentric prejudice who supposes that the modern Asian or African society does not regard the act of bribery as shameful in the way Westerners regard it... Bribery is at its heart an ethical problem' ( Bribes, Macmillan , NY,1984 pp. 702-3) .

'When Europeans 'discovered' Asia, Africa and America, one of their typical reactions was to point out apparent venality and lawlessness...in some cases they mistakenly classified as corrupt, the mores and modes of socioeconomic organization. The custom of giving gifts is one that was ( and continues to be) frequently misunderstood'. [9.2.24 and 32]. In other cases, the Europeans used corruption as an excuse for colonial occupation. 'Later authors have condemned the parochial and self-serving perspective of such Western writers as emblematic of imperialist thinking.. Therefore , partly to escape being labeled as imperialists, many present day scholars have avoided sensitive topics like corruption. These points have parallels elsewhere in the study of developing countries. The plights of the world's disadvantaged nations and peoples has an inescapable moral and ethical dimension . One finds in many developing countries, shocking violations of human rights; blatant racism, sexism and tribalism; widespread exploitation; and stark injustices in the distribution of power and wealth. Interestingly, those who stress human rights often

under emphasize the distribution of wealth and power and vice versa. How to react to this phenomena? Many students and professors avoid them altogether simply by avoiding the field itself. As with corruption, they may feel a kind of embarrassment. Subconsciously, they may suspect that studying these problems would inevitably lead to the conclusion that others are somehow 'inferior' or to be 'blamed' for their underdeveloped circumstances- something one would never want to say. Or they may have the nagging sense that the problems are hopeless. This may explain why remarkably few people nowadays study such policy problems in developing countries. Some of the hardest questions are avoided for fear of their moral content'.[9.8.28]. Nobel laureate economist Gunnar Myrdal called this an example of ' diplomacy in research'[9.8.45]. It must be admitted that it is very difficult to avoid the inadvertent inclusion of subjective assumptions in this kind of social analysis. In some cultures, some people ( or perhaps some government officials ) have such different values that corruption is less prosecuted and more accepted. It is all too easy to abuse the excuse of "cultural difference' as an explanation for the level of corruption. The rationalization one often encounters is that some grease money is good for developing countries because it speeds up the wheels of progress. This is insidious; grease is an evil necessity, it is expedient not efficient. Once initiated, people are drawn into an ever increasing spiral of payments. Bribery is essentially an unpredictable and unfair tariff increase. It entrenches the existing hegemony. It is analogous to arguing that opium relaxes tensions and is therefore conducive to a harmonious society. The promise of a desired end should not be used to justify inappropriate means.

In the US , public outrage at the level of transnational bribery of foreign government officials by US military and civilian aircraft vendors in the sixties resulted in the passage of the Foreign Corrupt Practices Act of 1977 (FCPA). Major contracts are so large that a bribe which is a small percentage in the bidder's view is a fortune to a government official. There are known instances of a ten to twenty percent 'commission' on billion dollar foreign aircraft procurement contracts. The FCPA makes a distinction between grease money and the bribing of foreign government officials. US nationals can be criminally prosecuted for making corrupt payments. Only Sweden has a comparable law on the books. The European Union and the World Trade Organization have draft legislation in the works. Transparency International, an organization headed up by Peter Eigen- a senior ex-World Bank official, is actively publicizing the effects of corruption: " Without question , businesses use their money to vote for the least corrupt country. If they do invest in a corrupt country, they expect a high rate of return and quick profit ...which , of course, feeds the lack of economic stability and irrationality in those countries. It is a vicious circle. The most significant damage caused by corruption is indirect. Corruption distorts the choice , the size, the timing of projects, the choice of contractors and the quality of the work supplied" [9.8.27].

'When the principal is from one culture and the agent from another, new problems arise. The principal may lack the power to select or penalize errant agents from another land. Information may be even more difficult to collect and interpret. Attitudes about corruption and its moral costs may not coincide. And , if one party is playing dirty, the

other party has little choice but to do the same. When agreed upon rules and penalties are scarce and are not enforced and when informational asymmetries are particularly pronounced, anti-corruption efforts can come down to bargaining and negotiating. Approaches that work in the West may not be appropriate in the East when cultures clash over corruption' [9.8.28].

2. The roots of corruption

Straight trees often have crooked roots goes a Chinese proverb. A philosophical analysis of corruption leads to ignorance as the root cause of corruption. Individuals and societies mistake pleasure for happiness. Pleasure - a craving for power, money, influence or sensual gratification - has a positive feedback aspect that begets greed. The potential for corruption exists whenever there is a distorted concentration of power- a maladjusted distribution of power . The person in power can use the position to make money, dispense favors, punish others, seek pleasure, more power and ego satisfaction. The *difference in power, wealth and influence is the potential for corruption*. An electrical engineering analogy is potential difference or voltage, and a hydraulic analogy is called available head. Electricity and water flow down the gradient. In societies, favors flow down the power gradient and payment of various kinds are extracted or offered up the line. Power corrupts and absolute power corrupts absolutely- that is the refrain of the classic literature of most societies. Besides the persons in a position of power, there are those in positions of influence who have the ear of those in power. They are more numerous and benefit by the process and profit greatly in the unofficial economy . The receivers of favors, the

bribers, are the most numerous and also profit by the system because they have secured an advantage over those who did not pay. All three types of players in this process have a common characteristic: they are looking after their own interests without regard to the costs or consequences to any one else. It is an extreme form of selfishness- a total disregard for the concern and welfare of others. They are callous and indifferent to the potential suffering of others who they prefer remain anonymous so as not to ruffle their own conscience. In poorer societies, the desperation of the lower strata forces them to put up with this form of extortion.

Inefficiency, bureaucracy, shortages of money, goods and services, a less than fair legal system, poor enforcement and protection and a visible lack of public morals all help the growth of corruption. Let us look at an equation:

potential for corruption = difference in {power + discretion-( accountability + transparency +disclosure)-wealth needed to survive}between bribe giver and bribe receiver. This is a modification of Robert Klitgaard's equation [ 9.8.28]. The words 'difference in', 'disclosure', 'transparency' and 'wealth needed to survive' and the parenthesis and braces have been added by this researcher.

The more discretionary power a person in power has, the more temptation there is for corruption. The behavior is then legal and chances of being reprimanded quite minimal. The more explicit the rules of conduct, the more widely available the information about details of the transactions, and the more stringent the requirements for disclosure, the less

the room for corruption. Accountable democracy, a free press, an enlightened and empowered electorate and a non-politicized legal system all reduce the potential for corruption. Accountability is affected by the probability of getting caught and the severity of the punishment. If anti-corruption bureaus are set up they have a problem. Too little power and they become toothless and ineffective. Too much power and the bureau is in danger being corrupt itself. When people in power are not compensated enough to be able to live in the manner that is considered acceptable by the person or his family commensurate with his position in society and the lifestyle of his social counterparts, then the potential for corruption increases.

In many societies, personal relationships are so important that people in power ignore and justify their ignoring the rules of conduct. Poor enforcement and complicity by others in equal or higher power levels adds to their confidence. Family and friends expect to be treated preferentially. After all, blood is thicker than water and friendship is a personal relationship as opposed to an abstract principle or dry rule on some pieces of paper!Since equal power distribution and higher moral and spiritual values are very difficult to sustain in the face of temptations, corruption rears its ugly head.

3. The relevance to technology transfer. There is much written about corruption in public life, politics, high finance and business and the wretched excesses of those in power, but not much scholarly literature is available for technology transfer professionals. Many people representing international businesses believe they have no choice but to offer bribes because they are certain that the competition is doing the same. They dare not stop the

practice because they will lose billions of dollars of contracts around the world. Corruption can and does subvert technology management and technology transfer success if only because these activities are played out within the overall framework of two or more cultures. As one senior international executive aptly put it : 'corruption makes technology transfer an impure process'.

If persons are chosen for tech transfer projects for reasons other than capability, then the probability of a successful transfer is reduced. If the adopter does not have the requisite technical background, training, capability, attitude etc., then there is likely to be a problem. One could end up with a non-performing product or process. One could create a personnel or environmental safety hazard. Quality control and quality assurance efforts may be frustrated. If the standards and certification bodies can be bought, then the confidence in the supplier chain is destroyed. If the purity of raw materials can be tampered with, then the testing and qualification costs of incoming materials skyrockets.

If confidential information can be bought, then intellectual property protection, trade secrets, know how etc. will leak out . One can quickly become paranoid if one is not careful. It is for this reason, technology transfer is limited by US companies to societies it can trust . There is no saying where and in what shape the technology may end up otherwise.

Greek and Indian mythology is replete with tales of indiscriminate 'knowledge donations'. This is obvious in the case of military or dual use technologies. The consequences for

commercial technologies are less spectacular in the public imagination but all too painful strategically and financially for the technology provider. Technology provider companies have different levels of comfort with the level and style of commercial and technical corruption in the adopter society. Corruption is one more elusive macro variable in their cultural compatibility assessment.

## SECTION 4

## ADVANTAGES OF THE CAMPS APPROACH

The concepts of cultural brokerage and social marketing is built into the CAMPS process. 'Cultural brokering is an activity that links two culturally different groups with the intent of increasing cultural appropriateness of services and increasing the resource base of the community' [9.2.33]. Social marketing is a social change strategy that utilizes marketing methods to move ideas rather than goods and services.

Earlier sections pointed out the difficulties of assessing the influence of culture in technology transfer undertakings, and among other things, the existence of a pro-technology bias and a donor bias. Having the technology adopter actively participate in the entire process helps to overcome these biases, facilitate dialog, build empathy in the provider by staying focused on the same objectives as the adopter and by tracking a common set of cultural variables and technology attributes. Perhaps the most beneficial aspect of this approach is the trust that is generated as well as the progress reporting that it gives both sides. The approach has the following additional advantages:

1. Generality.

Nothing in the approach limits its use to a given technology, geographical location, nation, culture or subculture. It can be used to assess the process when two different groups in the same company at the same location are involved, when two similar groups in different locations of the same company are involved or if two different companies are involved. Both intra and inter-company transfers are amenable to the analysis. The approach can accommodate international transfers and all manners of organizational structures and management styles.

2. Modularity

The approach will work as long as both sides are using the same variables and attributes and dimensions in the matrix. The individual row or column is modular. It can be added or removed by mutual agreement (between provider and adopter) without destroying the entire analysis. The meaningful abbreviated assessment is an example of such a sub-matrix. Existing environmental impact assessments and social impact assessments can be folded in quite conveniently. Vertical strips of the assessment can be taken out with some meaning attached to them for particular functional areas in a company, for example the legal group. This approach meshes with the interaction matrix technique [9.1.12].

Both use matrices that evolve with time. Whereas the CAMPS approach looks at conceptual interaction probability, the interaction matrix looks at personal interaction

probability. Once the conceptual interaction is identified, the transfer agents can look for the personal interaction matrix in anticipation. There is a practical and useful tie.

Words are often coined to express complex ideas. Consumer confidence is one. The understanding of these terms in specialized areas speeds communications. The CAMPS approach allows these macro words to be broken down into more basic variables and attributes for clarity in the analysis.

3. Flexibility

A full featured CAMPS assessment is not always possible because of time and cost constraints. A meaningful abbreviated assessment should then be used. The framework allows the technology provider and the technology adopter to collaborate and agree upon the scope of the assessment by choosing the cultural variables and technology transfer attributes that will be used in the matrix formulation.

4. Completeness

The approach is very comprehensive and thorough. A very complete check list for planning, implementation and integration has been made available . The process is designed to anticipate secondary and tertiary interactions and to identify their sources. It is designed to minimize unpleasant surprises and to reduce social distress.

5. Auditability

The process makes explicit many hitherto hidden assumptions in the technology transfer process. The matrices and individual cell scores leave a very detailed thought trail for subsequent review by participants or for third party review. A written explanation was one of the benefits of cultural analysis identified by Professor Schein (mentioned in section 2.2).

When computer experts were developing rule based expert systems ( a particular aspect of artificial intelligence), they discovered that what was initially thought of as intuition often turned out to be deeply embedded tacit knowledge that sometimes could be made explicit by techniques that became collectively known as 'knowledge mining'. The CAMPS approach has some aspects of this 'knowledge mining' built into it by guiding the technology provider through a systematic cultural assessment process.

6. Resistance to Obsolescence

As new information becomes available or as better understanding develops in either the provider or the adopter, it is not difficult to update scores in individual cells. Only the parts that change, need revision. By reviewing the revisions, one can learn from the evolution.

7. Cumulative Experience

In most current technology transfer undertakings , the experience gained is retained by the technology transfer facilitators and is sometimes published in papers and case studies. Corporate memory is not updated. The lack of a uniform methodology makes meaningful comparisons difficult. The very explicit nature of the CAMPS process facilitates revision of the matrix formulation and historical review . The model or framework is 'adaptive' in the sense that learning can be conveniently used to modify the matrix. Case studies using this approach should be more useful for comparative analysis.

In essence, the CAMPS framework allows persons involved in the transfer to categorize, discuss and weigh the various cultural aspects inherent in a given technology transfer.

## SECTION 5

## PRECAUTIONS AND LIMITATIONS OF THE CAMPS APPROACH

Cultures and societies are complex, non-linear, interactive and dynamic; this framework is relatively simple, linear and static for the duration of the transfer. The nature of cultural variables were discussed at length in sections 1.3 and 2.2. The difficulties of quantitative assessment were reviewed in section 2.8. The difficulty of verification and validation of the model using survey questionnaires, ethnography and other classical methods were recognized in section 2.9.

The framework has been created with the implicit assumption that trade, not aid is driving the technology transfer process. That , in turn, subsumes some capitalistic philosophical underpinnings. Capitalism has no inherent inhibitions against utilizing any available resource for production and economic well-being. In a philosophical sense, it defines the environment in a manner that is consistent with its nature of expansion and appropriation. When using this model in a situation where the technology adopter operates under a communist or strong socialist political environment, some extra care needs to be exercised to help the matrix formulation and numerical cell assignments.

It is recognized that the framework itself tends to steer cultural assessment along certain lines; this is true, however, of any organizing framework. Structure has its advantages , but it does impose discipline that is not there in other free-form types of assessments.

In addition, the following caveats have to be borne in mind when interpreting the results of a CAMPS assessment:

1. Meaningful data

Much information that is collected on the cultural aspects of technology transfer tends to be anecdotal, subjective and treated as peripheral to the problem. In fact, one of the reasons that the subject is being researched is that, up to now, cultural assessment discussions in technology transfer were not organized within an intellectual framework. This model is new in this regard. It is not a twist or embellishment of an existing model. It is based, however, on established principles, approaches and techniques used in other disciplines. The notions of cultural reactivity and probability of intersection of attributes and variables are novel. Use of this model in varied applications will help refine the model. The lack of 'academic quality' site data is not a disqualification, just a need that has been identified and can be filled.

2. Limits of the Technology Adopter

At the risk of sounding condescending ( and there is no intention of doing this), many technology adopters have limited understanding of the technology that they are about to adopt. They have seen the results of the application of the technology, but that does not

mean that they understand the technology. Even with the best of intentions, the adopter is often at a disadvantage when it comes to assessing the interactions (secondary and tertiary effects ) because of his or her unfamiliarity with a given technology. For these cases, the problem is likely to diminish from planning to implementation to integration because of the guided convergence encouraged by the CAMPS approach.

3.Social processes are slower

Note has been taken of the conservative nature of culture. Social processes and institutions react slower by nature as well as intent. Stability is associated with security. In section 2.8, the difficulty of establishing cause-effect relationships in the social sciences, as opposed to that in the physical sciences was observed. When CAMPS assessments are conducted, it should be recognized that the intermediate and long term effects of technology transfer may surface much after the so called integration. Public opinion of DDT, saccharine and many pharmaceuticals has been recently reversed . The World Bank no longer funds very large hydroelectric dams because of the long term consequences of environmental damage and social disruption that became better understood in the eighties and early nineties. The CAMPS approach is intended to minimize errors in social assessments. Society and culture are not understood to the point that one can predict the entire chain of interactions that will follow the introduction of a new technology.

4. Nature and Pace of Technology

New technology is so close to the fundamental understanding of nature that even eminent scientists are both mesmerized and awed by its deployment. Genetic engineering and similar technology is just so new, that providers and adopters cannot foresee all the consequences. The pace of new technology is accelerating. A backlog of stored reactions could be adding to the lack of understanding of technology-culture interactions in the recent past. In these cases, one cannot even look back and learn or relate to recent experiences that can be of benefit.

5. The Experience Factor

Technology transfer is still not a science. It is not taught as a major in any university. It is not even an official specialization in a recognized major. The closest option is technology management . The CAMPS approach can help take some of the uncertainty out of the cultural assessment process in a technology transfer environment. Better understanding resulting from further research will help firm up more guiding principles that will be of value.

## SECTION 6

## SUMMARY OF RESEARCH

Technology transfer and culture are both vast and complex fields of study. This dissertation has presented an intellectual framework for the study and assessment of the interaction in an international or inter-cultural setting. To help develop the model, a problem was used as a sounding board: Why has Indonesia been unable to develop an automobile industry of its own? How can technology transfer help?

The results of the research show that some general principles apply to any inter-cultural technology transfer situation and that the CAMPS approach shows promise-as indicated by the reactions of industry experts and university scholars who were presented with the approach . The advantages have been discussed in section 4. The limitations of the approach have been stated in section 5. Some overarching conclusions that can be derived from the research are:

Every culture has to work out an approach to technology transfer that is appropriate. Culture does not have to go out of the window when technology comes in from the door. Japan, Taiwan and Korea have shown that. Each one imported US technology in its own

unique way. The principles of infrastructure development, education/training and long term social goal to transition from an agricultural to an industrial society are common; the paths and choices of individual countries varied with their political structure, their economic resources and long term trade strategy. Simply copying another country's technology policy does not work. Each society has to formulate its own policy to suit its strengths and limitations. At best, trading partners can have empathy and become excellent teachers; the best among them do not just teach basics, but instill in technology adopters a lifelong desire to be able and willing to absorb new ideas and approaches.

US technology providers need to set realistic expectations; goals and timetables have to be based on international situations and market realities. Competition is fierce and the international business scene shifts rapidly and unexpectedly. Nimble and accurate responses are required. Flexibility is essential. Management control in the overseas operation should be given for strategic business reasons such as capability, funding and contribution to overall profitability. Selling equity for short term objectives such as cash injection or rapid local growth overseas is much more likely to bear surprises than in the US because of possible political policy shifts either locally or in the US.

Social agendas of host nation governments and companies pose a thorny problem. Technology providers should be careful about compromises in quality or supply sources to gain a local toehold or to gain political favor with bureaucrats. Winds shift, liabilities remain and tarnished reputations are hard to recover from.

Within the bounds of commercial competitiveness, it is desirable to behave not just as an acceptable corporate citizen, but one that is wanted. Social participation is good business sense.

In ventures abroad, US companies need to spend as much time up front as it takes to find the right local partner, lawyer and accountant. People are the key to success. Dissolving overseas relationships can be more difficult than in the US due to local laws that tend to favor and protect local interests. Other lessons gleaned from the research are:

1. Technology transfer related

Technology is part of the intellectual capital of a company and has to be managed as such. There has to be protection for the technology as well as a strategy to commercialize it. *Technology transfer is an important element in the overall strategy of technology management.* Management involvement in technology transfer is crucial for both sides. It is all too easy to underestimate the management effort that is required in a successful technology transfer.

Many technology transfers fail due to poor management and timing, not technical capability or capital. The best persons available have to be applied to the task. Picking people because they are problematic, in between assignments or need to be eased out of the corporate mainstream, is a big mistake. It handicaps the chances of success.

The CAMPS approach is designed to flush out potential problems of all kinds. In that sense, discrepancy matrices are not balanced reports. They are a litany of all things that have the potential for going wrong-not that they will. Many problems can and should be avoided. It would be a mistake to let the initial experience with the CAMPS approach deter companies from proceeding with legitimate technology transfer projects.

It is possible to conduct a meaningful abbreviated assessment tailored to the dictates of money and time available. It is a minimum requirement. When feasible, CAMPS assessments are recommended.

*Cultural empathy is probably the single most endearing quality a technology provider can possess.* It show respect for the other culture, caring for the partner and sharing of ideals and objectives. It enables dialog and communications and counteracts many of the mistakes that are inevitable in human relationships.

Preparation and planning are indispensable to technology transfer success and need to be started before any contracts are negotiated. A soon as the technology provider and adopter are known , the CAMPS approach should be employed. *Discrepancy matrices can be used both as predictors of technology transfer success and diagnostic tools for use during technology transfer planning, implementation and review.*

2.Communications and Marketing

Local presence and face to face communications are extremely important. The time honored practice of frequent meetings with the technology adopter by the technology provider is even more important in emerging technologies and in international dealings. To know the lay of the land, one has to have walked over all of it. No amount of abstract learning and distance communications can replace the experience of being there. One needs to evaluate the feedback that one is getting from the local market. If the data does not match the model, then it should not be assumed right away that the data is wrong. The model may need tuning.

Technology push is a much harder path than market pull. It seems obvious, but many companies are looking for a revenue stream from their technical capability and try to sell technology. The difference between sales and marketing as pointed out to me by Professor Blackwell is paraphrased as follows: selling is trying to find a customer for what you have to offer, marketing is giving the customer what he or she wants, when and where he or she wants it and at a competitive price.

3.Finance

Most of the discussions in this dissertation have been about culture and technology transfer. One should not forget the original purpose of the technology transfer . The premise has been that that trade, not aid, is the engine for growth at home, development

abroad and profit for both sides. When all is said and done, money has to brought in as US dollars and tallied in the books. The return has to be compared to the opportunity costs with all alternatives examined.

Most companies are in the business of providing goods or services that relate to their sphere of competence. They do not intentionally indulge in speculation, naked or otherwise. Currency risk is one aspect of finance that needs to be considered at the outset. Well established techniques of hedging are available for technology providers and are highly recommended for most companies, particularly those new to the international scene.

Most financiers are very well aware of the political risks of investing overseas. Many of them *make contingency plans for disengagement* should the unforeseen occur or potential problems do turn into real ones and cannot be handled. Technology transfer contracts should be drawn up in a manner that does one bad contract abroad does not drag down the technology partner at home. Some manner of damage control should be built in. As an example, one can recall the contract that Rolls Royce Aero Engines had with Lockheed in the seventies for the ill fated Tri-Star airplane. The carbon fiber technology that was used in the engine design was still in development in Rolls Royce when a fixed price, fixed time (with penalty) contract was signed with Lockheed . Manufacturing difficulties with the new material nearly put the entire Rolls Royce aero engine division into British Government receivership.

'Standard' accounting practices are not the norm internationally. In addition to legitimate local variations, one has to recognize the existence of creative accounting practices. Royalty payments, profit sharing, cost allocation, 'agency commissions' are all accounting allocations that can and do cause misunderstandings if the provider and adopter are on different accounting systems.

Getting quality financial information overseas is much harder than in the US. American style disclosure is uncommon in Europe and very rare in China, India and Africa. The network of US companies, banks, financial institutions, embassies and past business alliance partners provide valuable information that has to be augmented by locally collected financial intelligence from old hands in the area and from those who have spent time there in the recent past and are willing to share their information.

4. Legal

The bases of legal systems are different in different countries. It is a mistake to think that US style law is the norm. Foreign judicial awards may not be enforced in US courts and vice versa. Most cases of litigation in the US by patent holders are unsuccessful because of poor patent protection. The party that supposedly infringed the right was not restrained or fined. It is very essential to perform background research and then retain the services of a trustworthy competent lawyer who has experience in technology related areas.

5. Lifelong learning

Section 5 presented the limitations of the CAMPS approach. Section 7 is a detailed descriptions of the areas that need further development and research. This is an emergent field of study. The discussion papers in section 3 relied heavily on perspectives from East Asia and South East Asia. Cases from China, India, South America, Australia and Africa will add to our future understanding of the cultural aspects - the soft side, the one that is intangible but very real.

## SECTION 7

## FURTHER REASEARCH AREAS

Clearly one of the most needed resources in technology transfer is a taxonomy of terms and accepted definitions . This was pointed out in section 1.3.1

7.1 Matrix Shapes

The top to bottom shape of the matrix has an intuitive appeal, a quality that the eminent economist Joseph Schumpeter referred to as 'pre-analytic vision'. If most of the interactions occur at the artifact level, then one is somewhat justifiably inclined towards feeling that technology integration will be relatively short in duration , be mostly limited to the participating organizations and be relatively free of secondary and tertiary interactions. The corresponding discrepancy matrix will be overt and resolution at any stage will reduce problems at subsequent stages; the planning stage will diminish problems at the implementation stage which in turn will ease the integration stage.

If many interactions occur at the behavioral level, then one has to be prepared for a more protracted secondary and tertiary interactions in that subculture or industry, delayed resistance to specific aspects of the technology. Education and remediation efforts will probably be required for long term integration. Discrepancy matrices may advise us to

explore the benefits of better dialog and planning, to more closely examine the motivations of the major players and, if all else has been addressed, to prepare for and accept the unavoidable reactions-they may not be altogether pleasant, but they will not come as a total surprise.

Should the CAMP matrices have a significant amount of interactions at the shared assumptions and particularly at the beliefs level, then we should recognize that the a larger segment of the host society will react to the incoming technology which will be more of a potted plant than one that proliferates by rooting in the local soil. It may well be that , like nuclear power, insufficient time and effort was allocated to dissemination of information before the decision phase and thorough discussions and airing of issues were pre-empted.

This could have occurred for a variety of reasons: the benefits may have been clear to policy makers, planners, expert users, and commercial interests. The technology may have been very complex, requiring specialist interpretation or may have required organizational stability and material safeguards for periods much longer than anything ever attempted by society before. It often happens that the benefits are conferred by technology to one segment of society while the externalities are borne by others. In the case of nuclear power, the transportation, processing and storage location of nuclear waste were not

politically debated and bought into before the start of construction of the nuclear power plants. Subsequently, no politician would take a firm stand as policy options shifted with the public mood.

As more and more technology implementation quickly follows scientific discovery, the lines between science and technology are vanishing. This is particularly true in the cases of strong demand pull technologies such as life saving medical advances. Research in DNA genomes is being put into practice way before the cultural compatibility assessment is done .

Research is needed to help us understand how to plan for technologies that individually and collectively profoundly affect us at our very core. It seems that one should be able to come up with some matrix shapes that are encouraging and some that are foreboding. Doctors and engineers use visual diagnostic information integrators of this kind all the time- electro-cardiograms, electro-encelographs, control stability plots and so on. Tech transfer case studies and tech transfer plans should be mapped into CAMP matrices and algorithms used to see if some matrix shapes are more desirable than others.

## 7.2 Technology Transfer by Induction

In almost all the existing literature on technology transfer, one senses the presumption that the technology adopter knows far less than the technology provider and, in many cases, has very little to say about the technology to be transferred. While this is the most

common scenario, it is by no means universal. In several cases, the technology adopter knows what is needed in the application, but is not in the position or in the business of developing that technology. Two examples may help clarify the point. Utilities know more about electrical generating plant economics, maintenance, operations and required features, connections to power grids and so on. No manufacturer has that kind of experience. This is one reason why large utilities used to be technology leaders in their industry. Leading manufacturers had strong technical relationships with such organizations such as AEP, Duke Power and TVA and worked with them to provide them with the requisite technology. Airlines such as United, Delta and American know a lot more about aircraft operations, fuel costs, depreciation, maintenance, safety performance and durability than the aircraft manufacturers. Companies such as Boeing take in the experience of their major customers and develop the next generation of airplanes. Similar examples exist in other industries as well.

There is very little formal technology transfer theory or benchmarked empirical studies about the nature of technology transfer for situations where the technology adopter often knows what is required and how the technology will be deployed . In advanced situations, the technology adopter is driving the process: technology transfer by induction. While NASA today is involved in the more common form of technology transfer: spin-offs and spin -ons etc. , it must have in the early post-sputnik days , engaged in tech transfer by induction.

It must have created a commercial capability for its needs which could be met with technology that existed at the time. Technology transfer by induction is an area is worthy of research.

7.3 Multinational Enterprises and Their Adaptation to Local Culture.

'Multinational Enterprises are among the most powerful means available for transferring modern technology to developing countries and overcoming obstacles to utilization. By virtue of their large internal markets for capital, skills, technology and information, they face fewer market failures than local firms. In most circumstances, there is no reason to place restrictions on their entry-their presence can only benefit local productivity and competitiveness. Moreover, since MNEs are at the forefront of innovation, their presence provides an effective way of keeping up with technical progress. Their established brand name, global marketing presence and international flows of information all add to their technological advances'[9.1.20].

Percy Barnevik of ABB runs a colossal international technology conglomerate. He popularized a concept by his insistence that "ABB is not a multinational company-it is a multi-domestic company". While this may seem like a play on words, the point he made was that his company has roots in many countries and has some loyalty to each one of them. His management philosophy is to centralize information flow and strategic intent, but to allow local initiative in commercial and technical matters. Local managers can draw upon ABB's global human, capital , management, production/distribution and technical

resources to customize products, provided of course that there is not excessive duplication of human resources developing the same technology or excessive global production capacity at more than one location. For example, if ABB makes electrical railway equipment best in Switzerland, then that center is the repository of the technology. But that does not mean that the electrical locomotives for China have to be the same as those made for Switzerland ! The human resource policy of each country is different based on local conditions, but ABB overall policies are unmistakable worldwide. Managers move around within the system with the greatest of ease. Nestle and Phillips are two other such MNEs. Relatively little tech transfer literature appears to exist on how these companies assess cultural compatibility at their vastly different locations. In many cases they have to acculturate the technology; at other times they have to adapt themselves. Research of different MNEs and their cultural compatibility assessment and response strategies will provide valuable new insights.

7.4 Automating the Initial Generation of CAMP and Discrepancy Matrices

The CAMP and discrepancy matrices can be more efficiently generated if, instead of laboriously hand-crafting six CAMP matrices, three discrepancy matrices and calculating the individual cell scores , one were to develop a rule based expert system to speed up the process and make it more cost effective. Based on an English language interface and researcher inputs, the program could create matrices and populate cells with interaction probability, cultural depth weights and cultural reactivity numbers, calculate cell scores, create a 'characteristic shape' for each matrix, generate discrepancy matrices and even

make initial observations about convergence and success likelihood. The mechanics is not research material. The expert system development, the nature of the matrix shapes and convergence likelihood of the discrepancy matrices-all these need formal theoretical or empirical foundations that do not currently exist in a useable form.

## 7.5 Empirical Approaches to Screening Cultural Notes

Anthropologists have a finely developed sense of taking detailed notes on the their field trips and interviews. Since they are studying culture per se, and they have been at it for many decades, their practices are well founded and their findings are considered objective. In the case of tech transfer studies, the nature of the dialog is such that the person is offering his or her perceptions as to what worked and what did not and why. The field of tech transfer has not been around long enough to mature to the extent that the other social sciences have- and tech transfer is not a social science in the academically accepted sense of the word. There is also the distortion introduced by the recorder of the field notes, interview notes etc. which is very difficult to spot because no two situations are alike and the same 'site' is never visited in exactly the same way . Moreover there is no duplication of persons in tech transfer like we have in social situations being studied by the other soft sciences. The 'message' needs to be extracted from the (field and) interview notes and the appropriate cultural variables that are active in the transfer identified.

Some directed survey, identification and assessment of the methods used by social scientists and the development of a manual for use in tech transfer will be valuable to the profession.

## 7.6 Rigorous Basis for Weighting Cultural Variables

Cultural interaction at deeper levels is more profound, more permanent and more prone to produce unexpected non-specific reactions. Therefore, deeper interactions should weigh more heavily in our assessment of cultural compatibility. But by how much? What is the justification for the weight? Should the relative weights of the various categories be in ratios and why? This is far from clear. What is known is that cultural categories are overlapping. Does that suggest multiple-value weightings? Which value is appropriate for which situation? There are alternatives. One could give different categories non-numerical tags thus side stepping the problem, but that in turn makes overall assessments difficult. One is still left with a problem of relative depth within a category. There is also the problem of assigning suitable weights to the more complicated variables such as macro-variables, skewed variables, interacting variables etc. Considerable development is required.

## 7.7 Comprehensive and Systematic Organization of Technology Transfer Attributes

A modified four layer categorization for cultural variables has been proposed. A comparable organization is needed for technology attributes. Existing logical groupings of technology attributes used for activities such as environmental impact assessment, and

technology assessment ( Coates) have been extended to legal impact assessment and political impact assessment. There are many ways of grouping technology transfer attributes. While it is not being suggested that there is going to be only one definitive organizing scheme, it seems that a more comprehensive database of technology attributes needs to be created. It will make comparisons of tech transfer assessments much more meaningful.

## 7.8 Learning from Discrepancy Matrices

The concept of discrepancy matrices is a powerful one because it highlights the differences in perspectives between the technology provider and the adopter. It does not , however, explain the cause of these differences. So far, more dialog and planning has been prescribed. While this seems to make sense, it would be worthwhile to try to get at some techniques which a technology facilitator( be it tech transfer specialist or change agent or champion) could use to systematically probe the reasons for the differences to help the two parties isolate the specific cause of the differing perceptions and cell numbers . This will help enormously in bringing out in the open the sticking points in the transfer. A series of diagnostic procedures could be one approach to the problem. There are no doubt many others.

## 7.9 Acculturating Technology

E.F. Schumacher coined the term 'intermediate' or 'appropriate technology' in 1965. The notion was similar to a dress code that suits the occasion. In London, an intermediate

technology working group was formed and MIT had its alternative technology study group. Whenever a new technology fails to mesh with the local culture, there are two likely outcomes. Either the technology is rejected or some accommodation is made in the technology or in the host society. If the technology has to be modified, it is referred to as technology acculturation. At a superficial level, one may modify the appearance of a product or its details for compatibility with local climatic or electrical conditions. One may have to accommodate changes in the product to be able to use local parts and materials. One may modify a process or two. Local public transport in urban areas for ten or twenty people is a common requirement everywhere . Its solution varies from society to society. A minibus is a common solution. Sometimes alternative and even ingenious solutions are successful- the 'jeepney' of the Philippines is an example. It is a small truck like open body fabricated in local workshops and mated to an old Jeep engine and transmission.

There are many technical solutions which are presently being force fed to world markets that are user- unfriendly, even user hostile and quite indifferent to local values. One example is automatic- teller machines interfacing in English only that use eleven digit pin codes that have to entered via a keypad in fifteen seconds. Such machines are being tolerated in markets where there are no better alternatives being offered by the competition.

If technology acculturation were better understood and practiced, it would offer more value to the user and reward the technology provider. In developing countries, there is

prestige associated with having the latest technology, whether it is appropriate or not. The technology chosen should offer the best value commercially and should be capable of being supported locally . Hi-tech is a buzz word as well as a status symbol. If one were to take a detached and pragmatic look, one might find that medium tech is better. Medium tech implies that the technology has been tried and tested. In cars, some of us stay away from the first year of a new Detroit model to wait for the bugs to be worked out, for a new engine or transmission to prove itself, for parts inventories in dealerships to catch up, for repair technicians to be trained in maintenance and repair. Body repair costs, insurance history and reliability records then become available. Risks are reduced. The same attitude nudges technology adopters towards medium and even low tech. More research into what is appropriate technology for a situation will prove very useful. Much needs to be researched as to how the technology itself needs to fundamentally reworked for host societies.

Sometimes it is possible to leapfrog a generation of technology. Cellular phones in developing societies has slowed the introduction of wired phones, satellite TV has eaten into the cable TV market there also. It is not clear what requirements and conditions are necessary and sufficient for a leapfrog. Existing literature on the subject is quite limited and the underlying fundamentals are obscure.

## SECTION 8

## INTERVIEW NOTES

### 8.1 Notes on discussions with Mr. Toshikata Amino 9-10:30 a.m in 139 Hagerty Hall , OSU, August 8, 1997.

There are two aspects of the technology transfer process. The tangibles and the intangibles; the latter is very important, hard to measure, real and often makes the difference between success and failure. On the surface, many Japanese companies in Ohio may look the same- uniforms, cafeteria etc. But there are varying underlying philosophies that enable the companies respond to external challenges. Education, for example, is an intangible. At the manifestation level though, one can make some useful comparisons .

It is very important that young vocation school graduates be attracted to the automobile industry to form a pool of technical talent. If they are not being trained or are being absorbed in other industries, then the remedial measures will add costs to individual manufacturers. Tool and die technicians are one of several trades critical to the automobile industry.( Transfer lines, high speed automation only shift the need to deeper knowledge of these trades---my subsequent observation).

A concept that is useful is a 'receptive environment'. For an automobile industry to receive technology, a receptive environment has to be created. At a macro level, it has to do with availability of suitably trained technical manpower. At a micro level, within a company, technology receivers have to have the right attitude and preparation to move up to the new technology. This concept of receptive environment is a powerful metaphor that should be further investigated. The attitude of senior parent company managers is very important if tech transfer has to occur; sometimes tech transfer results in loss of parent company jobs to overseas affiliates. Short term pain is borne for long term gain.
For a country to be considered receptive, a lot of factors come into play. If TNCs have a feeling that they will be "used and told to leave in a few years", then they will stay away, unless an arch competitor gets in to shut them out of future competition.

For a self sustaining automobile industry ( or a self- sufficient one), one has to provide three capabilities: manufacturing, engineering and R&D. While lean manufacturing, kaizen (continuous improvement), just-in-time inventory control etc. has received a lot of attention, the other two are important for lower long run costs and survival. The engineering function has the difficult task of converting R&D concepts and technology into commercially viable practices.

The development of the Japanese automobile industry between 1950 and now is a worth while review. It will provide some insights as to how the industry grew. A useful

comparison with the Indonesia situation should be possible, even though times are different and the cultures are quite different.

Amino-San has produced a video-tape of Honda's global industrial strategy. He will make a copy available. Amino-San asked that the macro side of the problem at the concept/policy level- on the intangibles as well as the tangibles should be investigated. He will be going to Thailand and the Philippines next month to look at Honda's tech transfer performance. He will then be teaching in Japan till March. He gave me his phone/fax # in Japan and agreed to keep in touch.

Thailand has attracted a lot of international automotive investment primarily because of the freedom and lack of restrictions in local operations. Thailand had, till recently, a very stable economy and currency and was the staging area of automobiles for export, including China. Things have changed with China and the problems with the exchange rate of Thai baht. TNCs are re-evaluating their SE Asian strategy. The ASEAN entry level car, AFTA and complementation of parts all enter into the deliberations. Thailand is not a 'paradise within ASEAN for automobile manufacture'. There is likely no 'paradise' in SE Asia.

**8.2: Discussion with Mr. Jorn Lillelund, President and Director of P.T. Danapaints Indonesia in his Factory office, Jalan Permuda-Pulagodung, Jakarta, Indonesia between 10 a.m. and 12:30 on March 5, 1998.**

Mr. Lillelund is an expatriate Dane, who has been in Indonesia for about four years. Previously he had spent over twenty years in Saudi Arabia and the Gulf States in the paints and prtective coverings business. His factory employs over 400 locals and his company has marketing distribution ties all over Indonesia.

For the first few minutes, the nature of the currency turmoil and devaluation, its effects on mew business ventures and the real hardship it was causing to the workers, was discussed. He outlined his efforts to provide rice and cooking oil to his workers and to gradually ease some of his older workers back on to their ancestral farms so that they could live out the rest of their lives in dignity.

The nature of corruption came up. He pointed out that in Indonesia, Government loans are taken out without any specific date of maturity or specific mechanism for repayment. It is reminiscent of a ninety-nine year lease; the property will eventually revert back to

the original owner, but for all practical purposes, the lessee has ownership. The practice of corruption is so widespread and institutionalized, that it is accepted as the norm. There is no clear distinction between private wealth and the use of public funds for personal discretionary spending. It is common for heads of businesses to buy expensive homes and cars with company or government funds for personal use or for the use of friends and relatives. Personal relationships often transcend the law on the books. Each individual has his or her own rationalization for such practices. Being a good father or brother or friend has a higher social purpose than being an honest upright citizen.

He said that his information is that the closure of eleven banks by the Government was a public relations exercise for the International Monetary Fund ; the purpose was to obtain a rescue package and to create market confidence. It was business as usual for the politically connected wealthy. Cronyism was alive and well in Indonesia.

Technology in Indonesia is treated as a skill, not a capability. What is taught, is learned and practiced, but not absorbed, integrated and improved. He stated that his paints are used in auto refinishing, not as original materials in automobile manufacturing. He found the Japanese keiretsu system very hard to break into. The tight relationship that Toyota and Honda have with their first tier suppliers in Indonesia and Japan , make it difficult for outside suppliers to get a toehold. Danapaints could not take business away from established suppliers just on price and delivery alone.

He observed that, in general, auto paint refinishing garages did a poor job because they did not use paint ovens for drying. This meant that dust settled on the air in the course of natural air drying. Uneven drying and humidity in the air create defects such as an 'orange peel' finish. He has tried to upgrade the technology being used by refinishing garages by encouraging the use of drying ovens, but so far, it has been an uphill battle. The additional costs due to equipment, electrical power, real estate, quality control and other overheads drives up costs. Without this, though, it is not possible to get a hard durable mirror finish. The technology that he is sponsoring, is eco-friendly in that the air from the paint drier is filtered to take out the particulates. This not only preserves the environment, but also recovers some of the paint in the process. The environmental protection laws are so loosely worded and so poorly enforced, that garages that play fast and loose have very little to fear. Refinishing is chosen by middle income families who keep their cars for long periods of time; they are very sensitive to costs. They have been patronizing shade tree garages because of the low prices. The wealthy have so much money that they change their cars frequently and do not bother with repainting.

On the subject of joint ventures and cultural factors, he pointed out that the Islam practiced in Indonesia was much more ' mild' than the version practiced in the Middle East. Muslims that he came into contact with in Indonesia were truly devout, compassionate and tolerant of other faiths. The different groups had coexisted for very long and enjoyed each others holidays, festivals and foods. It has always been possible

their advantage. One example was the pressure put on Chinese Indonesians. The fact that some of them were Christians meant that the Europeans and Americans understood them better. This was interpreted by the locals as a pact between the two to take wealth outside of Indonesia! ( Mr, Lillelund's secretary is ethnic Chinese.) He felt that joint ventures should be entered into only after at least a year of local residence. He has opportunities to enter into joint ventures very soon after he arrived and he pursued them, but they did not materialize. He feels that it is fortunate that they did not ; the party in question turned out to be less than reputable.

Mr. Lillelund felt that there will be considerable belt-tightening in Indonesia for at least a year. He said that the fundamentals are there- a large population with a pent-up demand, vast natural resources including petroleum, and strategic location along key sea trading routes. Indonesia is key to the prosperity of SE Asia. It is big political player in the region and cannot be overlooked by European and American interests.

**Discussion with Mr. Lawrence Chew, Managing Director, Meritorauto Heavy Vehicles (Singapore) Pte. Ltd., 1 Gul Way, Singapore 629191. Feb. 12th., 1998.**

Maritor is the new name of the automotive division of North American Rockwell, which was spun off as a separate company last year. The President of Meritorauto, Mr. Prakash Mulchandani is a personal friend. The Singapore factory is over ten years old and makes truck brake and transmission parts for SE Asia truck assemblers. The company employs over three hundred workers, a third of whom have been brought in from India and China because of low wages and the current tight labor market in Singapore. They are screened by a battery of written exams and skill testing tests. They are then interviewed by Mr. Chew. Each worker is then processed by the Singapore Government, which charges the company $300 (US) monthly tax for each foreign worker. The company helps each worker find accommodations, transportation etc. He is then trained for six weeks before being paired with a mentor and then eased into the workplace. Within six months, the worker is expected to pass a Government exam in which he is required to demonstrate a working knowledge of English and the basic laws that govern Singapore life. Passing this test frees the company from having to pay the $300 monthly tax. Renewal of the work visa is on a case by case basis and depends upon the employment

conditions. The program has been a huge success because of Mr. Chew's personal commitment and belief in the program.

It turned out that Mr. Chew had spent five years as a manager in Indonesia and returned to Singapore to provide better educational opportunities for his children who had reached school going age. Mr. Chew graciously called the Managing Director of TEXMACO in Jakarta, an Indonesian conglomerate involved in truck assemblies , to arrange an interview for this researcher.

Mr. Chew contrasted the British, American and Japanese business styles. He said that the British have traditionally had, and continue to have, strong ties to Singapore. The educational, judicial and parliamentary system have been modeled on the British system. The older civil servants and cabinet ministers, including Senior Minister Lee Kuan Yew, are British educated. British business lost its influence in the seventies and the eighties and has not regained it since. Singaporeans going to Britain in the sixties were racially demeaned and have not forgotten the humiliations. British businesses did not respond to the competitive pressures from American and Japanese businessmen. The latter were not condescending to the Singaporeans and were more flexible in their approach.

In terms of cars and consumer electronics, the Japanese dominate. Cars are right had drive, the same as in Japan. The voltage and frequency of the electrical power supply is also the same. The Americans are dominant in financial services, information

technology, commercial aircraft, military hardware and security systems. The US also greatly influences lifestyles; department stores, high end men's clothing ( Polo, Brooks Brothers etc.), movies, newspapers, magazines, soft drinks, clubs, restaurants (TGIF, McDonals, Pizza Hut, Baskin Robbins etc.), hotels ( Marriott, Hyatt, Crowne Plaza etc.) are the most popular.

The Americans had, what he called , 'child- like directness and exuberance' which the Singaporeans liked but could not emulate. The American lifestyle is what Singaporeans dreamed about. Domestic servants liked to work for American families because they were very well paid and very well treated- some say, spoilt. American technology was well respected but was employed in the high end of the market because of the cost. . Hewlett Packard was an exemplary employer. All ink jet printers for the world were produced in Singapore. Seagate had just announced the opening of a disk drive plant . The Singapore government was trying to lure a chip maker to locate in Singapore as opposed to Malaysia or Thailand.

The Japanese were formidable competitors with a long term perspective. They ere thorough in their market research and provided quality products on time and were customer- service oriented. They were tenacious. They considered Asia to be their area and would not relinquish market share. The Japanese are admired but not loved. People still remember the Japanese occupation of Singapore. Japanese technology transfer to Singapore has not been very significant. Some Japanese money that was based in Hong

Kong has been moved to Singapore. Japanese trading companies often use Singapore as a base for their SE Asia operations. Wealthy Japanese businessmen come to Singapore for medical treatment because of the relatively cost and the access to world class doctors who visit Singapore periodically.

Singapore is very expensive compared to its Asian neighbors. Land, skilled labor and utilities are very expensive. But there are no unions, strikes are forbidden crime and drugs are practically non-existent and overall productivity is very high in the white collar segment. There is virtually no corruption. The civil service and police are excellent. The Government is pro-business.

Singapore is transferring its project management experience by setting up industrial parks in Indonesia and China, and by offering to set up and operate an airport in India. Foreign governments are sending their police and customs officials to Singapore for training. In terms of 'social engineering', Singapore is a world leader.

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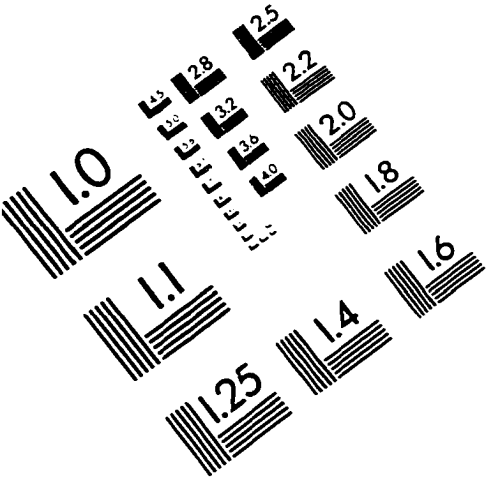


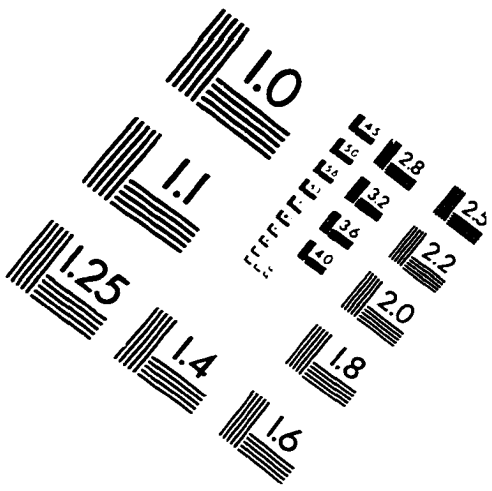


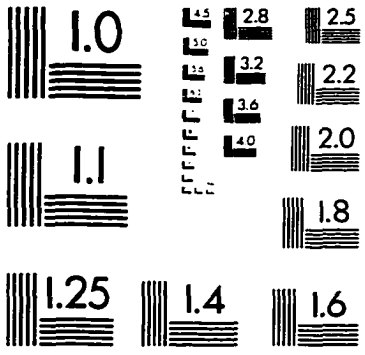


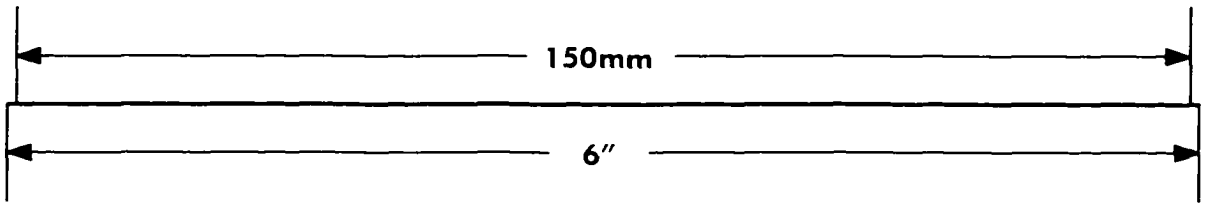


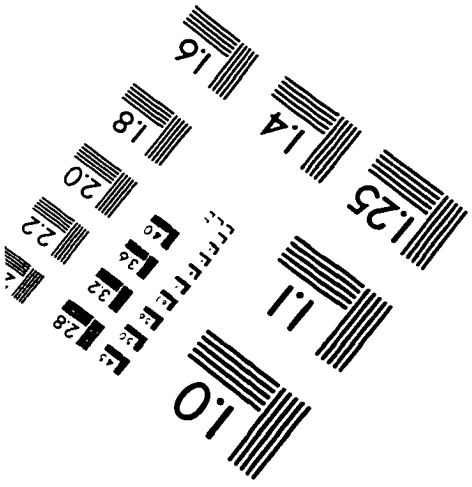


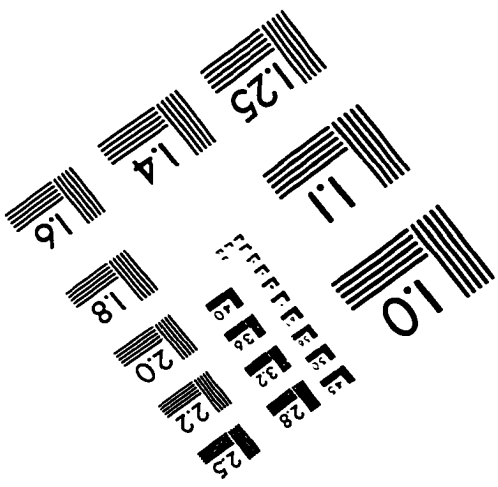


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