1990

Technology transfer from the United States to China's state-owned enterprise via Chinese public administration.

Fengru Li
The University of Montana

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TECHNOLOGY TRANSFER FROM THE UNITED STATES TO
CHINA'S STATE-OWNED ENTERPRISE VIA
CHINESE PUBLIC ADMINISTRATION

BY
Fengru Li
B.A., Nankai University, P.R. China, 1982
M.A., University of Montana, 1990

Presented in partial fulfillment of the requirements
for the degree of
Master of Public Administration
University of Montana

Approved by:

Chairperson, Board of Examiners
Dean, Graduate School

Date
To

Montana Energy & Research Development Institute

Upon completing this paper for my MPA degree, another for MA degree, and leaving Montana for the University of Washington in Seattle for a doctoral program, I want to express my genuine appreciation and gratitude to MERDI who made my eight-year dream of obtaining advanced education in the U.S. an incredible reality.

It was an early arrival of my dream because without the generosity of MERDI who provided the scholarship covering the tuition and living expenses for my first master's degree at the University of Montana, I could have been holding this dream up to this moment.

My heart-felt thanks and affection are imparted to John Orth, President of MERDI and to every member of the board of directors. They have shown genuine concern, care and interest in my education. I had the privilege of visiting MERDI and meeting every member of the board. I was greatly impressed by their friendliness, warmth only found in Montanans, humor, witty, and integrity.

My deep love is extended to Maureen Flemming who recommended me to MERDI and provided me tremendous help, be it academic or personal, during my four years at the University of Montana. Above all, she took the initiative to encourage me working on this project and supervised the progress.

It is my hope this paper on US-China technology transfer will be of some help to the American businesses who have been doing or want to do business with China.

Fengru Li

August 1st, 1990
Management Dept.
Nankai Univ.
Tianjin, China
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ACKNOWLEDGMENTS

The completion of this professional paper is the result of the spiritual support and assistance of many individuals who always offered me a helping hand. I shall forever be grateful to those who have made my four years in the United States a lasting and sweet memory.

My genuine appreciation and gratitude are expressed to all my committee members: Dr. Ron Perrin, chairman of the committee, for his extraordinary patience and tolerance in correcting my Chinese-English, for his intellectual ideas, academic advise and personal encouragement; Dr. Maureen Fleming, academic adviser, for her unique motivational methods; and Dr. William Chaloupka, for his straight forward constructive criticism and valuable suggestions. Having one of these very knowledgeable and well recognized professors on one's committee would have been fortunate. Having all three was a miracle.

My tremendous gratitude goes to the professors of the Political Science Department from whom I gained both knowledge of the field and understanding of commitment and integrity in teaching.

My heart-felt thanks and deep love are extended to Bryan C. Thornton, general manager of UM bookstore, who has been the number one "problem-shooter", for problems both academic and personal. He and his wife, Jill, made my survival of graduate studies much easier.

My special appreciation and affection are imparted to Barbara Burke and Rich Harris who unconditionally supported my education with free room, academic tutoring, and care during my first year in the U.S.. The same affection and gratitude go to Ms. Dorothy J. Phelps, M.S. who has consistently offered encouragement, financial help, wisdom, and incredible understanding; and to the Robertson's in Miami, Ohio who have always been with me when I am in need.

Songhai Li, the manager of Tianjin Center deserves a special appreciation. His brilliant insights and unconditional help are demonstrated in this paper.

I owe Bruce Ford a "Wo Fei Chang Gan Xie Ni". He edited the first draft of this paper and many times had to translate my beautiful Chinese into academic English.

I especially am grateful to the Management Department of Nankai University, Tianjin, China and its chair Chen, Bingfu. It was there my interest in business management was developed and career started.
EXECUTIVE SUMMARY

This study on the transfer of American technologies to China's state-owned enterprise via Chinese public bureaucracy was conducted to examine a major variable ignored in the current U.S.-China business relationship: the functional roles played by China's technical public bureaucracies in the importation of Western technology.

This issue was chosen to be the focus because academics and practitioners in the fields of public administration and business management had not adequately addressed it, nor had they discussed the future consequences of the phenomenon. Furthermore, given the fact that some current studies on the issue indicate more ad hominem arguments than convincing statements, more bitterness and resentment than solution-oriented intention, the writer meant to present a more unbiased perception of the past.

The overall objective of this study was to increase the awareness and understanding of the inevitable and crucial roles of Chinese public bureaucracy in the U.S.-China technology transfer. Through understanding, more objective rather than emotional alternatives could be developed for future transactions.

To accomplish the goal, methods of case study and literature research were employed. Specifically, the author (1) analyzed two cases she studied on American technologies transferred from private businesses to Chinese end-users;
(2) presented a historical review of the types of technologies China imported in the past ten years from the West with a focus on the United States; (3) clarified what American businesses perceived to be the "short, unhappy romance" in their past operation in China; and (4) concluded the study with four recommended strategies for American businesses to cope with the dilemmas in their future interactions with Chinese technical bureaucracies. Each of these four aspects will be summarized in the following.

First, the writer presented two cases, "Who Actually Shot Grand" and "The Lucky BurryKing" to help gain a retrospective view of how technologies from private American businesses were transferred to Chinese end-users. The first case depicted China's national level bureaucratic procedure that contributed to Grand's loss of the $50 million bid after two years of business negotiation. Other elements discussed were: the complicated initiating procedures for technology importation, fragmented decision-making authorities among key bureaucracies of Beijing, how the foreign currency for importation was allocated, diffusion of responsibility among technical bureaucracies and the parental relationship between Chinese public bureaucracies and industrial end-users. The second case, "The Lucky BurryKing", described an effective technology transfer transaction between a Chicago business and a state-owned enterprise in Tianjin, China through a local Chinese
bureaucracy. It implied several variables that led to a successful transaction such as, targeting a key Chinese agent, selecting channels of communication, using an effective bureaucracy to get around superior and parallel bureaucracies.

Following the cases was a review of the US-China technology transfer operations in the past ten years. The United States, in the past ten years, has ranked the third major technology supplier to China after Hong Kong, European Common Market and Japan. China, since its economic reform, has imported varieties of technologies from the U.S., from soft technologies such as intelligence, human resources, and management to the hard technologies of technology-intensive industrial equipment.

Given the extensive participation of American businesses in the Chinese market, American technology suppliers today related their last ten years of transactions with their Chinese partners as a "short-lived happy romance" "in the same bed but with different dreams". Some frustrated American businesses perceived their business operation in China to be "2+2=1/2", i.e., it costs twice as much and takes twice as long in China to make half the normal profits made elsewhere. Instead of affirming or rejecting those American views, the writer concluded two factors that had influenced Americans' perceptions: the incompatible goals and the unmatched business practices.
between American technology suppliers and the Chinese government and end-users.

Responding to some future remedies recommended by some American academics, the writer analyzed three major dilemmas facing American businesses in their future interaction with Chinese public bureaucracies. They are (1) the intertwining of business opportunity and political instability in the China market; (2) the conflicts between the efficiency-oriented American private businesses and process-oriented Chinese bureaucracies; and (3) the increased competition among fragmented Chinese governmental agencies in handling technology transfers.

In conclusion, the author presented and discussed four strategies for American businesses to overcome their language and cultural disparities and thus better survive Chinese bureaucracy. The first strategy, "seeking cooperation from the U.S. government", underlines the rationales and possible means of governmental involvement. The second suggestion, "targeting the right Chinese public agencies", describes three components of a right agency: (a) profile of science and technology committee; (b) profile of a local agency; and (c) profile of an agent. The third alternative, "discovering China's informal information channels", leads Americans to the exploration of what constitutes the informal channels. The final strategy, "learning the high-context culture communication skills",
investigates some dysfunctional "American ways" exercised in the Chinese market and thus illustrates some coping skills.

The rationale behind these suggested strategies was conceived to balance the naive conceptual framework Americans had brought with them to the Chinese business environment.
INTRODUCTION

The transfer of technologies from developed countries (DCs) to less developed countries (LDCs) has captivated the attention of the LDCs in their modern industrialization. China, as the largest developing country, has actively transferred technology from developed countries since the early 1980s during its economic reform.

The transfer process, however, has not been as promising and smooth as the technology suppliers had expected. One of the unexpected experiences for Americans is "the unpredictability of working within a Communist system" (Mann, 1989).

A typical characteristic of a "communist system" as opposed to a "capitalist system" is that operations of transferring foreign technologies to local users are carried out by public agencies rather than by end-users or private brokers. Therefore, the behavior of the Chinese public bureaucracy in technology transfer operations becomes the focus of this study.

The needs for this study assessed by the writer as follows. First, few research studies have provided a retrospective view of to what extent China's public bureaucracy controls and operates economic activities such as technology importation. Nor have the available studies reflected the consequences and dilemmas of such bureaucratic phenomena.
Second, few studies conducted by American academics have placed adequate emphasis on three functions characteristic of Chinese public bureaucracy: the watchdog, policy-maker, and policy implementer. In contrast, U.S. public bureaucracy has only a watchdog role over the U.S. technology suppliers (Glinow; Schnepp & Bhambri, 1988). Hence, the unofficial network through which Chinese public agencies close transfers has seldom been open to scrutiny in the past.

Last, but not least, American businesses and academics have not paid enough attention to the consequences of their "giving-and-taking" model in international technology transfer. This model implies that "we as technology suppliers have every right to set the rules". As this study shows, rules are set by the business environment where the technology is transferred.

Given the above assessed needs, this study is designed to achieve three goals. First, through two case studies, American businesses will become more aware of the functional roles played by the Chinese public agencies in transferring western technology to Chinese end-users. Moreover, some negative impressions held by Americans toward Chinese businesses may be altered through a retrospective review of Sino-U.S. operations in the past ten years. Finally, with an understanding of some future dilemmas in doing business with centrally planned economic systems American businesses
may develop coping strategies.

The organization of the present study reflects the writer's belief that only when American businesses are equipped with the "know-how" (coping strategies) as well as the "know-why" (philosophies implied), the "know-me" (perception of self) and the "know-thee" (perception of Chinese), can they make full use of their potential in an international market. Accordingly, four chapters are developed.

The first chapter, "Technology Transfer In Action", presents two cases on Sino-US technology transfers operated by Chinese public bureaucracies. Next, Chapter Two, "Sino-U.S. Technology Transfer In Retrospective", reviews current literature on technology, technology transfer, and Sino-U.S. technology transfer transactions in the 1980s. Chapter three and four are the focus of this study. Chapter three, Same Bed, Different Dreams: Realities Americans Discovered, discusses the two cases and the writer's arguments against some misconceptions. Chapter four examines some problems existing between American businesses and their Chinese partners with a focus on bureaucratic operations. The writer concludes the study by analyzing some future dilemmas facing American businesses in their interactions with centrally planned economic systems and four possible coping strategies.
CHAPTER ONE Technology Transfer In Action

Abstract

Sino-U.S. technology transfer is especially difficult because the operation is between a market in which private business owns, controls and allocates resources and a system where public agencies control and allocate resources for end-users. The two cases on Sino-US technology transfer studied by the writer in 1986, a $50 million hot-strip mill bid and a technical cooperation project, describe the bureaucratic procedures and operations. They may serve to illustrate both the difficulties encountered by American businesses in China and, more broadly, the general pattern of interaction between a private corporation and a Communist economic system.

Case 1, Who Actually Shot George Grand?

"No one can believe it! The two-year-negotiation ended up a fiasco," George Grand, President of the America Iron & Steel Corporation (AI&S) came on strong. It was an autumn morning in 1985 at the Great Wall Hotel in Beijing, capital of the People's Republic of China. Mr. Wu Ming, project director from the Ministry of Metallurgical Industry (MMI) located in Beijing, had just officially informed Grand's four-member-team that they missed the $50-million bid for the hot-strip plant technology. The bid was invited by the Ministry in 1983 through the China Technology Import & Export Corporation, a parallel public agency in Beijing.

1Both cases presented in Chapter One were studied by the writer between 1986-1988. They were based on real business incidents except all names of the businesses and personnel involved were disguised for the purpose of protection. The study methods included unofficial interviews with the key management personnel concerned and review of business files.
Grand was also informed that a German company took the bid at $45 million with the same services package Grand had offered. Grand confronted Mr. Wu:

What shocked us is that negotiations for this bid had lasted two years until a moment ago when we were told we missed it. Were the decision made earlier, this could be the moment we say "Gan Bei", wine in glass, celebrating the profits we both made from the project. Or, my corporation could have been somewhere else. I would like to repeat again what I mentioned at the very beginning of this marathon negotiation, that it would take only three months to make this strip-mill profitable. Unfortunately, no action had been taken. Instead, two years were wasted at this bargaining table! It is just foreign to me how the numerous trips by my colleagues and my five personal visits to your country for the bid led to a nothing (Li, interview with Q. Han, coordinator of the project, on December 9, 1987)!

The glaring eye contact from Grand at Mr. Wu intensified the embarrassing silence. The rest of Grand's team had a moment to go through some new name cards from that day's Chinese team, a phenomenon Grand would call "a constant hassle of matching cards and titles to the ever-changing Chinese negotiation staffs."

**Background information.** The year 1985 was the fourth of China's full-scale economic reform aimed at the realization of four modernizations by the year 2000 (i.e. the modernization of agriculture, industry, science and technology, and national defense). 1985 was also the end of China's sixth Five-Year-Plan, according to which industrial adaptation and modernization of the existing industries was given priority. Some heavy industries, such as turn-key...
projects, technology-intensive equipment and production systems, were among the privileged lines to technology importation (Johnston & Li, 1988).

The direct recipient of the hot-strip mill technology was the Northeast Iron & Steel Complex Import & Export Corporation (Northeast hereafter), a state-owned economic entity located in the northeast of China with 150,000 lifetime employees. Northeast is one of the four leading iron and steel industries in China subsidized by the Ministry of Metallurgical Industry. Northeast enjoyed a double-privileged status as being both a heavy industry and as a prioritized government subsidiary. Accordingly, it was entitled to foreign currency appropriation for modern technology importation.

An opportunity came for Northeast in 1982. MMI required Northeast to initiate an import package in order for MMI to obtain annual foreign currency appropriation from the National Economics Planning Committee. Northeast proposed an importation package, a technology-intensive hot strip system. The technology would modify the existing technology structure designed in the early 1970s.

MMI controls the nation's metallurgical industry under China's centrally planned economy. Since heavy industry has been the base of China's industry since the founding of People's Republic, MMI started importation of mining technologies from the United States, West Germany and Japan.
in 1977, four years before the urban economic reforms.

**Transfer operations.** The importation of this $50 million technology followed a well-established chain of command and clear-cut division of labor among public agencies. As with any costly importation project, it was the responsibility of the potential end-user to initiate a sound importation proposal prior to foreign currency appropriation in the capital. Accordingly, Northeast underwent its in-house procedure before the proposal reached MMI.

First, the headquarter of Northeast required its technicians at the current hot-strip plant to submit a technical proposal for the imported technology. The proposal would enable MMI to be eligible and competitive as a foreign-technology-recipient at a round-the-board foreign currency allocation in Beijing. Specifically, the proposal justified the necessity, urgency, technological functions, anticipated cost and benefit of the needed technology, as well as desired suppliers.

Second, the plant technicians were required to submit their research proposal to the technology department of the plant. Data included a tentative feasibility study of the needed technology. An in-plant technical debate followed. The proposal, as approved by the technology department, was later transferred to the chief executive of the plant, who brought it to an extended executive meeting for collective approval.
The executive management of the hot-strip-plant, upon consensus, delivered the passed package to Northeast headquarters for further technical debate, scientific tests and collective decisions at the corporate management level. The headquarters, therefore, initiated the following procedures within its own staff and functional departments. Specifically, the Equipment Department executive held an extended collective decision-making session presented by staffs from the departments of Planning, Technology, and Finance. Staffs from the hot-strip plant were also given a seat. Two major goals were attained at this senior level: a comprehensive technical justification of the proposed technology and a documented importation proposal for MMI in Beijing.

MMI presented the original package from Northeast to the China National Planning Committee for foreign currency budget appropriation. The Planning Committee, having approved the project with an allocation of 50 million U.S. dollars subsidy, authorized China National Technology Import & Export Corporation (China Tech. hereafter) to invite bids from overseas.

China Tech., a public technical agency in Beijing, is authorized by the National Economics Planning Committee to be in charge of any technology importation of at least three million U.S. dollars. The agency shoulders total responsibility for conducting business negotiations and
contracting. The bid was put to market in 1983 by China Tech. for MMI and Northeast. Since China Tech. was not affiliated with the technology recipient, Northeast was excluded from the negotiating table in Beijing. Nevertheless, the end-user was entitled to be kept informed of the negotiation process by China Tech., as Northeast had final decision power over contracting terms, excluding the price. This meant Northeast was capable of accepting, rejecting, and/or modifying any contract terms other than price. In this sense, China Tech. played the role of negotiator for Northeast who was behind the scenes.

Negotiations with the bidding foreign technology suppliers started in 1983 in Beijing. The Chinese team was staffed by technical bureaucrats from China Tech. and administrative bureaucrats from MMI. The early birds for the bid were three leading American corporations: General United Corp., V. Steel Corp., and America Iron & Steel Corp. Non-U.S. competitors included AEC, a West German company, and three Japanese Corporations. Due to Northeast's preference for American and Germany businesses, the America Iron & Steel Corp. and the German AEC were selected to enter into formal negotiations.

Led by Grand, the four-member team of AI&S made their first business trip to Beijing in 1983. Senior leaders from MMI gave them a tour of Northeast. Grand was very much impressed by the hospitality and the technical
sophistication of the Northeast technicians and its management. He also found that Northeast had been well connected with some American businesses from whom it imported technologies. In the words of a Chinese technician, "We enjoyed most the American technicians, their humor and people-oriented training techniques." Based on his impressions from this first trip, Grand felt greatly (and, it turned out, falsely) encouraged that he could eventually win the bid. Grand's people were extremely proud of their state-of-the-art hot-strip mill technology in the US, and their technical service including training and consultation, which caught the attention and interest of the Northeast management and its technicians.

Grand led four more trips to Beijing between late 1983 and autumn 1985, and had dozens of negotiating sessions with China Tech. During each phase of the negotiations, the Chinese replaced staff including translators, technicians, and decision-makers, depending on the sophistication of the technology required in each phase of the negotiations. Grand was very proud of his 4-member team except he did not have a bilingual interpreter as his Chinese counterpart had.

After his third trip to China in late 1984, Grand foresaw a positive outcome for AI&S Corp. because China Tech. and the end-user had expressed their satisfaction with the modern technology, services, and fringe benefits offered. Moreover, details such as phases of technical
service, training etc., had been discussed and agreed upon. Grand's team had been cordially received by Chinese higher administrators in Beijing such as the director of the Ministry of Economic & Trade Relations, the Minister of MMI, the President of China Tech and the President and executives of Northeast. Each of these bureaucracies had held banquets for Grand's team. Grand was very impressed by the Chinese hospitality. However, he had been bothered by the tough and tedious bargaining by his counterpart over the price. He had no clue what made those Chinese bureaucrats bargain so hard over the price. He was confident that his technology was sophisticated and services unbeatable.

Whenever Grand started accusing the Chinese bureaucrats of being laymen, Davidson, liaison for the project, would try to calm him down by assuring him that the bargaining was only a negotiation tactic of the Chinese. Davidson further argued that Northeast highly appreciated their package and never complained about the cost. "The Northeast people told me they had the final say whether they want the technology or not," Davidson was also very confident because he had developed "Guanxi" (favorable personal relationship) at Northeast.

Grand took for granted that the contract would be signed during this trip. Director Wu from MMI, cigarette in hand, responded to Grand's confrontation through his translator:
We feel very sorry for your loss. As a matter of fact, we appreciate as much your sincerity in cooperation as your technology and service. Had there been some compromise on the price from your corporation, the deal could have been made long ago. We Chinese have an old saying, friendship is developed even though the business deal is not made. We believe there will be more opportunities for cooperation in the near future since we are old friends now.

We have arranged a trip for your team to Xian to visit the recently excavated underground Forbidden City where is buried the first Chinese Emperor Qin Shi, who united China in B.C. 221 (Li, personal interview with Q. Han, coordinator of the project, on December 9, 1987).

Grand boarded that afternoon's flight for San Francisco.

Case 2, The Lucky BurryKing

THIS TECHNICAL SALES REPRESENTATIVE AGREEMENT is made as of this 1st day of December, 1986 by and between BurryKing, a Chicago corporation, and The Tianjin Science and Technical Exchange Center (TSTEC), Tianjin, People's Republic of China....

This Agreement constitutes the entire agreement between BurryKing and TSTEC, and all written or oral agreements, representations or understandings of any kind that may have been made prior to the date hereof shall be deemed to have been superseded by the terms of this agreement....

The transfer of BurryKing's technology was completed by a Chinese local public bureaucracy, TSTEC (Tianjin Center hereafter) located in Tianjin, China's third largest industrial city. The importation included BurryKing's special bearings, its technical training services and

Based on the draft file obtained by mail from the Tianjin Center, March, 1988.
periodic consultation. The end-user was a leading state-owned engineering industry in Tianjin, the Tianjin Machinery Manufacturer.

By the end of 1986, two engineers from Tianjin had completed two months training in Chicago by BurryKing and returned to Tianjin to work as technical representatives of BurryKing. By 1988, with the imported special bearings, technical service and consultation, the recipient had manufactured a new model of engine, and marketed both domestically and internationally. In October, 1988, BurryKing and TS&TEC renewed their previous two-year contract.

**Background information.** Tianjin Center is a self-claimed non-governmental public agency. In reality, it is a direct subordinate branch of the Department of Science & Technology of Tianjin. Its 15 staff members are salaried governmental employees, recruited and assigned to it by the Dept. of Science & Technology of Tianjin. Its business operation is a mixture of centrally planned economy and market economy. For example, the center does not charge consulting and service fees from their local clients, mostly government-owned enterprises. It charges foreign businesses, however, for any services. The consulting fees paid in foreign currency are turned in to the local government of Tianjin.

The technical functions of Tianjin Center reflect the
main stream of China's open-door policies in economic reforms. Specifically, it acts as a liaison agency bridging the West with Tianjin industry in the field of technology transfer. It facilitates information exchange between technology suppliers and recipients. Apart from being a liaison and an information center, Tianjin Center, above all, is one of the authorized legal representatives for the city of Tianjin.

**Retrospective transfer activity.** Early in 1984, a three-member business delegation was sent on a fact-finding mission by the Tianjin city government. They visited the University of Chicago, its science center, the Business Association of Chicago and some industrial manufacturers. In the previous two weeks, the delegation had traveled to five eastern states of the United States, visiting twelve cities and dozens of industrial manufacturers. This delegation included the general manager and the assistant manager of Tianjin Center, both of whom had B.S. degrees in engineering and knowledge of English. A translator, recently graduated from college, accompanied them. Their mission, as Li Ruihuan, the Mayor of Tianjin defined it, was to further open Tianjin to the U.S. market by discovering and developing more opportunities for bilateral technology transfers.

"Their efficiency beats us Americans," the director of the Ohio State Technology Transfer Center said, expressing
his admiration of the group. The President of Modern Machinery Industry in New York complimented the group, saying: "In the past several years of China's economic reform, I have received numerous delegations sent by China. So far, this is the only efficient and effective group including no laymen" (Li, personal interview with S. Li on May 1, 1986).

By the end of their three-week trip in the United States, the group had gathered information on several American industries that would be qualified for bilateral technology transfer with Chinese end-users. BurryKing Corp. in Chicago impressed the group most for its technology, service, and consulting staff. The executive management of BurryKing demonstrated their company's high potential for being a committed technology supplier to Tianjin.

On returning to Tianjin, the delegation reported on their visit to the mayor. It was not long before the center started taking action to realize potential transfers. To start with, the assistant manager was personally in charge of matching the interested American suppliers to potential end-users in Tianjin. He distributed all the catalogs brought with him from the trip to concerned industries in Tianjin for feedback. In the case of BurryKing, several catalog recipients contacted the center expressing their interest in BurryKing's technology package for the purpose of modeling a new generation engine.
In the second step, the assistant manager scrutinized the current public policies on technology importation. Between 1983 and 1986, Chinese government policies encouraged the most rapid economic reforms since 1949. According to the assistant manager, "there are many possible interpretations of policies, as well as loopholes in each of them, hence one can always avoid being caught later."

Having the governmental codes on his table to justify his action, the assistant manager took the total responsibility to screen and decide which applicants should be financed through bank loans. He set the following five criteria for the end-users of BurryKing's technology: (a) the applicant must be a prioritized business in Tianjin industry to get financed by the state-owned bank; (b) it must have credibility in debt liability; (c) a sound management crew was a prerequisite; (d) it should have a certain percentage share in the domestic market; and (e) the feasibility study submitted by the applicant should demonstrate its ability to absorb the new technology.

During the third phase, Tianjin Center conducted step-by-step business promotions to bridge BurryKing, as well as other American businesses, to the concerned Tianjin industries. First, the assistant manager and his assistant held a city-wide press conference introducing the American businesses to representatives from Tianjin industries. Being a high level government agency in Tianjin, the center
had access to other governmental agencies in Tianjin and in Beijing. Invited to the conference were representatives from the city's industrial manufacturers, key bureaucrats from related industrial bureaus, and academics from technology research centers, concerned colleges and research institutes.

Next, Tianjin Center forwarded the feedback from the conference to BurryKing and other American technology suppliers. Soon, the center arranged for suppliers from the U.S. to come to meet the potential recipients in Tianjin, in the presence of people from the center.

After a scientific feasibility study conducted by the center (actually by the assistant manager himself) on behalf of the end-user, the center submitted a documented study report to the Tianjin Science & Technology Committee for bank loan approval. Two factors crucially influenced the approval from the committee, the technology absorption and debt liability of the user. With the documented approval, the center began working with concerned public sectors controlling the state-owned banks to obtain a foreign currency loan. "The bank trusts the center, not the individual user. It is much more efficient and effective for me to get the loan for the user than for the user to get it itself," said the assistant manager (Li, telephone interview with the assistant manager on December 20, 1988).

After twenty months of work, the transfer was
contracted. To close the transaction, Tianjin Center formalized in written form its future responsibility and accountability to BurryKing and the user. Some of the center's responsibilities include: to (a) advertise BurryKing's technology in China; (b) testify to the quality, modernity, sophistication, and feasibility of absorption of the technologies to be transferred; (c) screen Chinese sales representative for BurryKing; (d) keep BurryKing informed and (e) charge consulting fees.

On being interviewed privately, the assistant manager who personally initiated and accomplished the above business activities reflected:

As a manager of a public agency, I've got to know what is unknown to the public. In order to get something done, I need to abide by governmental regulations to protect myself from being caught later. In the meantime, I have to get around both superior and subordinate bureaucracies to be efficient. BurryKing complained the deal took twenty months. What they don't know is that had it not been me who has had 12 years experience in dealing with technical bureaucracies at local and national level to handle the case, the BurryKing deal could have gone up in smoke.

What's more, I am a self-motivated patriot. The whole deal was completed with only my bicycle as transportation. Efficiency is in the eye of the beholder (Li, telephone interview with the assistant manager on December 20, 1988).
CHAPTER TWO  Sino-US Technology Transfer In Retrospective

Abstract

Two cases are presented in the previous chapter as an aid to understanding technology transfer channels in China. This chapter introduces (a) the concepts of technology and its international transfer; and (b) the technologies that have been transferred to China through its public bureaucracies.

A. Concepts of Technology and Its International Transfer

Technology has been increasingly transferred to China from developed countries in the 1980s. The prevailing academic discussions on the technology structure indicate a more diversified and sophisticated conceptualization of today's technology than is commonly perceived. The following summarizes some recent arguments.

Technology is defined, by some, as "know-how" or the sum of knowledge, experience and skill necessary for establishing an enterprise and for manufacturing a product economically. While this definition may be adequate for many purposes, it should be noted that technology needs to be viewed not only as the specific process or manufacturing technology, but also as various other types of knowledge and expertise necessary for the planning, establishing, and operation of a plant (Aggarwal, 1988). Technology, be it the form of tangible products, or concepts and information, is seen as value-laden. "It reflects, in design, operation, and inherent expectations about its utilization and advantages, the culture in which it was conceived" (Fischer,
Technology is also "the knowledge about managerial actions that has application in a business setting" (Aharoni & Sticht, 1988). In the most tangible forms, technology can be turnkey projects, plant technology, infrastructure and specific machinery. In the intangible forms, technology can be "intelligence, technical consulting services, education, training, and even free information carried in literature" (Liu, 1988).

Large-scale transfer of the technologies defined above did not happen in global settings until the 1950s—especially after the creation of the European Economic Community. Transferring technologies internationally has been a hotly debated issue provoking high emotions among supplier and recipient countries.

Americans did not realize the consequences when they transferred steel industry technology to Japan in the 1950s and 1960s. The technology recipient, Japan, became a strong international market competitor to America in the 1970s and 1980s (Gold, 1988). Given the consequences, it is not surprising that some American academics advocate technology protection. For example, when China publicly claimed at the United Nations in 1982 that science and technology are "part of the universal human heritage, which should be shared by all countries, particularly developing countries" (Simon, 1984, p.301) Denies Simmon, a technology consultant with American and Chinese governmental agencies criticized the
These Chinese responses reflect both a naive understanding and somewhat paradoxical view of science and technology. From an economic standpoint, the Chinese position reflects a lack of appreciation for the costs associated with research and development activities and for the value of proprietary knowledge as a commercially marketable good. From a governmental standpoint, domestic or multilateral regulations adopted by other nations to control technology outflows to protect their own perceived security interests have been poorly received in Beijing (Simon, 1984, p.301).

Disparate as the political and economic perspectives of the international transfer of technology seem to be, technology suppliers have been well aware of the fact that the international transfer is a complex process, by which expertise or knowledge related to some aspect of technology and operations is passed on from one culture to another (Aggarwal, 1988). The process of transfer is considered to be the communication, adaptation, and use of technology from one economic region to a second region. It is further recognized that technology transfer is not simply the reproduction of an identical enterprise in a second area, but an adaptation of the original which has been modified to fit that second region's peculiar social, political, technical, climatological, economic, and educational environment (Aharoni, 1988).

China, as a recipient of technology from developed countries, as well as a technology supplier in certain fields, has been engaged in literally all forms of
technology importation during its economic reform in the 1980s. The following summarizes its technology importation.

B. China As A Radical Technology Recipient In The 1980s

Governmental treaties and cooperative projects. As noticed by some Westerners in the 1980s that "never before in the history of the Communist regime has the Chinese leadership been so actively engaged in bilateral and international science and technology activities" (Simon, 1984, p. 234). According to the information released through an overseas journal, Chinese Scholars Overseas in May 1988 by the China Science & Technology Committee in Beijing, China had signed bilateral science and technology cooperation agreements with almost all the major industrialized countries during its economic reform. These formal agreements have been complemented by a myriad of nonofficial, informal cooperative relationships with commercial firms, professional societies, etc. In the area of international science and technology transfer, the Chinese government had signed formal agreements with 26 developed countries. At the nongovernmental level, many Chinese local administrations (equivalent to states, counties and cities of the U.S.) had signed contracts for technology exchange with the West. Among them, 46 contracts went to West Germany, 44 to France, 27 to the United States and 18 to Great Britain (Wu, 1988).
China's dramatic shift from her three-decade practice of "third world orientation" to the present "developed country orientation" in international platforms is interpreted by Americans as "a radical departure from Beijing's past practice of 'politics in command'" (Simon, 1984, p.297). China's embrace of imported technology also indicated that after three decades of turning her back to the West, China's current domestic science and technology capabilities were insufficient to meet the pressing demands of modernity, especially those generated by the current economic reform.

Intelligence and expertise. Apart from governmental treaties and projects, the transferring of western expertise and intelligence to local businesses, the public sector, and colleges sparked a "booming" period in the mid- and late-1980s. After several years of experiments in economic reform, the Chinese government started shifting its emphasis from importation of "eggs" (hardware technology such as machinery) to "chickens" (software technology such as management knowledge). The technology of intelligence and expertise has been imported by China in eclectic forms, ranging from foreign-profiled consulting services, management training, and free technical training attached to industrial transactions, to non-Chinese management skills possessed by foreign stockholders in joint venture businesses located in China; from educational exchange
programs to free information exchanged in literature.

One of the major factors impelling China's transfer of this type of "software technology" is an intention to remedy her earlier overemphasis on "tangible technology importation": complete plants, production lines etc. With this conceptual framework, China has invested in such areas as the following.

Consulting service, another form of transferring foreign "soft" technology, appears to be very promising although still new to China. The pioneer in this field, the International Technology Consulting Corporation (Inter-Tech) located in Tianjin, was established in 1987. This Singapore-based business, coordinated by the Tianjin Science & Technology Commission, is staffed both by American technical professionals and local experts, whose job is providing scientific and technical consulting services to foreign technology suppliers as well as to Chinese end-users.

Management training is taken by local and governmental Chinese agencies as an effective channel for transferring modern western theories and practices to Chinese economic entities. The formal transfer originated in the late 1970s when the United States, at the invitation of Beijing, set up the first training center in China, the Sino-US Dalian Training Center. For eight months each year, business executives and American intellectuals from selected
universities go to Dalian, a northern coastal city of China, to lecture and conduct seminars for management professionals, teaching faculties and graduate students selected from major industrial cities of China. George Schultz, U.S. Secretary of State, spoke highly of the training center during his 1986 visit, accompanied by the then Chinese President Deng Xiaoping.

Educational exchange had been conducted not only by universities but also by Chinese local public agencies. China's MEA (Management Enterprise Association), for example, has affiliates in every major industrial city in China. Each subordinate MEA has attracted individual professionals from developed countries to offer regular classes, lectures or workshops on management. According to the U.S. State Department's Bureau of Public Affairs, hundreds of scientific and technological delegations visited China between 1980 and 1988 under the auspices of America's science and technology accord, the largest accord the US has ever had. On the other hand, about 80,000 Chinese students and scholars came to the United States between 1979 and 1989. Of those, about 43,000 remain in the U.S. today, forming the largest bloc of foreign students on American university campuses (Mann, 1990).

The employment of foreign executives to run Chinese government-owned industrial businesses opens another channel for transference of managerial knowledge to Chinese
enterprises. The first non-Chinese chief executive, a German engineer, took a management position in 1982 in the city of Wuhan. In that major industrial city, the German successfully managed a Chinese government-owned engine manufacturer. Subsequently, the first Japanese executive was hired in July 1988 to manage another Chinese government-owned enterprise, Dalian Power Plant in the north (People's Daily, June 22, 1988).

Joint-ventures and foreign-ventures. The China-western joint business ventures located in China "provide foreign capital, advanced technology, modern managerial skills, and access to international markets" (Liberthal & Prahalad, 1988). Despite being a most problematic and hotly-debated subject among foreign stockholders, joint-ventures have taken a considerable portion of imported technology. According to a Chinese governmental organ, People's Daily, China had about 6000 joint-ventures with foreign partners by July 1988. One hundred and eight ventures were located in Beijing. The year of 1988 saw some 600 American small and medium-sized businesses heading for China seeking further opportunities for joint-venture. In addition, about 180 wholly foreign-owned ventures operate in China (Liberthal & Prahalad, 1988) and about 600 U.S.-Chinese joint ventures have been established (Gladstone, 1989).

Technology-intensive equipment. Plant technology and infrastructure contributed a considerable percentage of
China's import volume in the past decade, when $30 billion was spent on importing foreign technologies. The imported technology led to a sixty percent increase in China's annual output (Huang, 1988). After several years of experimentation, shifted its focus from transferring complete plants to acquiring soft technologies, as mentioned earlier in this chapter. In addition, Beijing gave preference to the acquisition of new and sophisticated materials and selected advanced equipment and components from technology suppliers (Simmon, p.303). Beijing's importation strategy shift was intended to accomplish three things: (a) to speed up the pace of China's modernization; (b) to further modify and adapt the existing industrial structures; and (c) to more effectively meet domestic consumer demands.

Guided by the new orientation toward importation of sophisticated technology, China transferred modern telecommunication technology to its own research and development system. The result of this transfer, the China Post reports, was a 74 per cent success rate in applying R & D results to the domestic market. The technology application has enhanced telecommunications in over twenty major cities in China since 1984 (Staff, 1988).

Regarding the second importation orientation, toward domestic industrial modification and adaptation, the $50 billion bid case in the first chapter has illustrated its
significance. The third importation strategy, transferring foreign technology to ease domestic consumption pressure, is illustrated by the importation of a piano manufacturing system from Sweden by a Chinese government-owned industry (Reporter, July, 22, 1988). The Liaoning Piano Manufacturer, one of China's four piano producers, purchased for $750,000 an entire manufacturing system from a bankrupted leading Swedish piano manufacturer. The importation was to ease increasing domestic demand, as the possession of a piano by a modern urban nuclear family had become a symbol of "family modernization".

According to some westerners' observations, China's shift of strategy on foreign technology importation "reflects China's increased sophistication in selecting international technologies" (Simmon, 1986,).

Given the active involvement of the Chinese public bureaucracy with the United States and other developed countries, what have been the consequences and reflections from both the suppliers and the recipient? In the next chapter, discussions and reflections from Academic and practitioners perspectives will be evaluated and the writer's critique presented.
Chapter Three  Same Bed, Different Dreams: Realities

Americans Discovered

Abstract

Regarding the past ten years technology transfer from the U.S. to China and present reflection on the transfer operations, the author raises two arguments in this chapter. First, American businesses rushed to China with misconceptions imposed by governmental leaders of both sides and cultural legacies. Second, the underestimation of the functional roles played by Chinese public bureaucracy contributed to Americans' present negative impression of the past experience with China. The arguments are supported by an analysis of the two cases studied in chapter one and findings from a selected literature.

A. The "Gold Rush"

So many American businesses rushing to China was an unprecedented phenomenon in the history of both countries. Two important factors contributed to the "gold rush": the governmental images and the conventional wisdom and culture possessed by American businesses.

Governmental images. What China had done during the 1980s was a grand experiment in her own history. The third president of China's Communist regime (1978-1989), Deng Xiaoping "not only permitted but invited, indeed encouraged, Western corporations to join hands with Chinese state enterprises in his effort to reform China's economy" (Mann, 1990, p.135).

The Chinese leader's determination to modernize China was affirmed in 1978, the first year of China's economic reform. According to published information provided by the

However, the radical and ambitious importation plan caused domestic disorders such as budget deficits, extensive capital construction and problems in controlling inflation. As a result, a strong austerity plan was in effect by the end of 1978. China canceled many foreign contracts.

Following dramatic economic growth from 1981 to 1985, importation of advanced technology and equipment from abroad was ranked a priority for China's 1987 to 1991 plan (Punnett, 1989, p.155). China had depicted a rosy picture to the West of its economic reform.

The American government reciprocated with similar enthusiasm. When President Reagan visited China in April 1984, he declared that China was only "so-called communist". Also at that time, an administration spokesman told the White House press corps that Western businesses would earn "megabucks" in China. The Reagan administration in 1984 held out the prospect of China's purchasing twelve nuclear

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3According to information provided by Hong Kong: Economist Intelligence Unit (1986-87, p.18), the target gross of industrial output for 1981-1985 was 4% of annual average growth in real terms. The actual output was 12.6%. Moreover, the 3.8% targeted national income was replaced by the 9.8% actual growth.
power plants within the next few years (Mann, 1989).

**Conventional wisdom and cultural legacy.** "Americans heeded the China call largely as the centuries-old Western desire to penetrate and capture the vast China market, now one billion people" (Mann, 1989, p.25). This motivation recalls the same dream that has beguiled Western companies since the Industrial Revolution, exemplified by this statement from a British writer more than 150 years ago: "If we could only persuade every person in China to lengthen his shirttail by a foot, we could keep the mills of Lancashire working round the clock" (Mann, 1989, p.25).

Americans in the mid-1980s were convinced by the reform image of the Chinese leaders that the Chinese were eager to embrace American-style capitalism (with its concomitant reality of unemployment, bankruptcies, and wide disparities in income) (Mann, 1989, p.58) American businesses, thus, wanted to bring about revolutionary changes in American-Chinese business relations; they wanted to compete with their international rivals by gaining a share in that 1.1 billion population market with its inexpensive labor. The adventurous and committed Americans wanted to be the first to get into China in a big way; they believed that the industrial miracle which happened in their own land could be transplanted to China's system.

The consequence was that in the mid-1980s, "American business interest in China was virtually limitless, and
there were, indeed, few companies, entrepreneurs, lawyers, or investors who weren't thinking, dreaming, or scheming about getting something started in China" (Mann, 1989, p.5). American Motors Corporation set up the first model joint venture, Beijing Jeep, in the capital of China. In 1985 alone U.S. companies rushed to form more than 800 joint ventures with state-owned enterprises in China, compared with only about 900 in the previous five years. Real, financial commitments were not made by the Chinese partners (Pye, 1986). Another 6000 American small and medium businesses followed their fellow gold seekers to Beijing in 1988, seeking business opportunities. By 1989, the U.S. has established 600 joint ventures in China, taking fourteen percent of foreign investment in China and ranking as one of the top four trading partners with China after Hong Kong, the EEC, and Japan. As American journalist Jim Mann observed while stationed in China during that period, "at no other time in the twentieth century have the institutions of Western capitalism sought to do business with and inside a Communist state to the extent that they did in China during the 1980s" (Mann, 1989, p.22).

It is fair to conclude that during those experimental years, American businesses landing in China were largely motivated by the encouraging comments from their own government and positive image of the Chinese leaders. The risk-taking and success-oriented culture of the Americans
became another contributing factor. In the same way, Chinese state-owned enterprises were eager to become modernized entities within one night. Like almost every major business in America rushing to China, every leading Chinese industry wanted foreign technology in whatever form. Being equipped with foreign technology became a status symbol, and a partnership with a Western business meant a privileged access to scarce means of production.

However, few of the participants contemplated to what extent the Americans rushing to China had been well informed of the decisive and crucial roles played by Chinese national and local bureaucracies in business. Moreover, was China's bureaucracy structured for a planned economy prepared for the market mechanisms introduced with foreign technologies? Would the technologies that had thrived in the U.S. survive in China? The following will address these questions with an analysis of the two cases detailed in Chapter One.

**B. Encountering Chinese Public Bureaucracy**

The two cases demonstrate that American businesses, as soon as they landed in China, encountered numerous technical bureaucracies operating foreign technology transfers. As a matter of fact, ad hoc public agencies, such as the Tianjin Center (case 2), were organized at national and local levels in the past ten years to handle the swarms of technology suppliers from the West.
Case analysis. One major difficulty experienced by the American suppliers in the first case was their underestimation of bureaucratic roles in the transfer. When President Grand led his expedition to Beijing for the $50 million bid, he encountered a bureaucratic culture foreign to him.

To start with, Grand was unable to comprehend the parental relationship between the Beijing bureaucracies and the end-user, Northeast. To his understanding, since Northeast needed and preferred the technology supplied by his corporation, the transfer transaction should be closed efficiently. As negotiations with different Chinese governmental agencies continued, Grand became more confused as which agency was supposed to be accountable and responsible for both the technology suppliers and recipient. Furthermore, he had no clue why his Chinese counterparts were extremely sensitive to price. Finally, the fact that the end-user had no authority and decision-power for the importation was unheard of to Grand. The frustration was complicated by the expressed intention of the end-user: they preferred the quality and service provided by Grand's corporation to other suppliers such as Japan.

The second case indicates similar problems dealing with bureaucracy. What makes it different from the first is that the Tianjin Center went through the bureaucratic procedure instead of leaving the supplier in the dark. Moreover,
there was an individual, the assistant manager, who was committed to the transaction. To gain a better understanding of the impenetrable bureaucratic network functioned in both cases, Johnston and Li (1988), in their "The Industrial Buying Behavior of People's Republic of China" singled out the following behind-the-scene bureaucracies that were decision-makers as well as policy-implementers.

The Ministry of Foreign Economic Relations and Trade (MOFERT). MOFERT ranks as one of the highest public bureaucracies of China, paralleling the China National Planning Committee. The latter controls the national industrial budget including the allocation of foreign currency for importation. The stated missions of MOFERT include: (a) implementing government promulgated principles and policies on foreign economies and trade; (b) importing advanced technologies; and (c) coordinating activities of the regional and local foreign trade agencies.

In the case of the $50 million bid, MOFERT, supervised the project through its subordinate agencies, such as the government-owned foreign trade corporations located in the capital.

Foreign Trade Corporations (FTCs). The ten FTCs located in Beijing are the secondary public agencies balancing China's local and central authority in foreign trade, and are divided along product lines. The China
National Technology Import & Export Corporation directly handled the $50 million transfer for a local technology recipient. It is also the agency that was bypassed through the efforts of Tianjin Center's manager (Case 2).

FTCs in Beijing primarily link foreign businesses and Chinese end-users. They are also the liaisons between foreign business and Beijing government. Westerners are often first referred to such bureaucracies before entering their target markets. Only those well-informed of China's bureaucracy are able to skip this layer. Such was the case in the example of BurryKing, which targeted a much smaller local bureaucracy in the first place.

Apart from implementing policies from MOFERT, FTCs shoulder the responsibility of contracting with foreign technology suppliers on behalf of local technology recipients. In practice, however, other fragmented public bureaucracies have been challenging and competing with FTCs. The roles of FTCs have increasingly been taken over by individual ministries, such as MMI in the first case, local public agencies, such as Tianjin Center in the second case, local trading corporations, and even some leading state-owned industries such as the Northwest Steel Corporation. These bureaucracies have made contact directly with Western technology suppliers. Motivations for such a "taking-over" are: (a) technologies are transferred more efficiently to end-users, and (b) required fees charged on technology
suppliers can be collected by local agencies handling the case instead of FTCs in the capital.

Ministry. China has more than fourteen functional ministries in Beijing, paralleling the functional departments in Washington D.C. such as the Department of Commerce. Each ministry has autonomy to initiate and complete technology importations depending on the dollar value. In the first case, the $50-million project was above the cap of importation autonomy, so the Ministry of Metallurgy (MMI) had to diffuse its responsibility among other agencies. For instance, MMI played the role of a treasury agency (with the allocated $50 million budget) to its subsidiary, the Northeast Corporation. During the negotiation stage, MMI was a liaison and regulator between China National Technology Import & Export Corp. and the Northeast.

In other situations, however, a ministry has total autonomy. For example, in 1985, MMI itself authorized and allocated $3 million foreign currency to Northeast for the importation of an electronic reading system from the U.S. In 1987, the MMI led its own team to Montana and transferred $2 million mining equipment to its subsidiary, Northeast.

Depending on the dollar amount, a ministry such as MMI can play roles from treasurer, business negotiator, regulator and contractor for its subsidiary. What is unknown by the foreign technology suppliers is the fact that
some in-house policies are known only to a certain level of Chinese bureaucracies. This notion is foreign to Americans who have developed faith and respect for publicized documents and codes.

**Others.** The number of parallel public agencies with overlapping roles and responsibilities creates an impediment to understanding by outsiders, especially action-oriented American businesses. The China Council for the Promotion of International Trade (CCPIT) can serve as an example. Located in the capital, CCPIT has affiliates at almost every local government (including provinces, municipalities, etc.). CCPIT is promoted as an independent agency under the jurisdiction of MOFERT. Its business scope includes promoting foreign economic and trade ties, concluding non-governmental trade agreements with foreign firms, and arbitrating economic, trade, and maritime disputes (Johnston & Li, 1988, p.3-5). This agency is more of a symbolic than a functional task agency.

According to the manager of the Tianjin Center, had the process gone according to official rules, the BurryKing case would have had to go through many different local bureaucracies (including Tianjin Foreign Economy Relations & Trade, Tianjin Machinery Imp. & Exp. Corp., Tianjin Council for the Promotion of International Trade, etc.). All of these are affiliates of central government bureaucracies in Beijing.
Reflection. Given the theoretical and functional roles of each technical bureaucracy studied above, diffusion of responsibility and accountability for clients is inevitable. Such bureaucratic behavior is common to modern bureaucracy elsewhere as "modern bureaucracy has become control institutions increasingly ruling society, polities and government" (Hummel, 1987 p.3).

However, what distinguishes the technical bureaucracies in China's planned economy from the ones in market economies is that each technical bureaucracy in China "handles the export and/or imports of a large group of goods and services. Domestic enterprises producing exports or using imports normally do not deal directly with foreign firms but operate through the offices of the foreign trade organization that actually carries out the international trade transaction" (Robock & Simmonds, 1989 p.334).

Another feature typical of Chinese technical bureaucracy is described by Max Weber as that (a task agency) once established, and having fulfilled its task, an office tends to continue in existence and be held by another incumbent (Hummel, 1987). To deal with the newly established task agencies as well as the existing structured bureaucracy can be one of the dilemmas facing American technology suppliers in the future.

C. Lessons Learned: Same Bed, Different Dreams
After ten years of what some Americans called a "short and happy romance", they realized they had been "in the same bed but with different dreams" as concerned their Chinese partners. The American businesses felt lost in China, fooled by the rosy illusions and frustrated by the business practices there. Ten years before, the word "China" excited literally every American business, but in current literature the image of China is overwhelmingly negative. The goldfield is now pictured as a ghost town. Following are reflections from the American side on their past experiences with their Chinese partners.

**Incompatible goals.** It was not fully realized during the gold-rush years that Americans and Chinese had different goals and priorities in mind. As mentioned earlier, the primary motivation for Americans doing business in China is to capture the 1.1 billion person market and maximize profit. This illusion of the purchasing power of 1.1 billion people ignored the reality that eighty percent of the population are peasants who have only recently managed to live above starvation.

The American government conveyed similar notions to business, as when the White House press section forecast that Western businesses would earn "megabucks" in China. The U.S. National Security Advisor, Robert McFarlane predicted, in a nationwide television program covering Reagan's visit to China, that "perhaps hundreds of thousands
of Americans and other Westerners" would be going to work in China (Mann, 1989, p.306).

Similarly, Chinese leaders had their own goals and fantasies to fulfil: the wealthy westerners would bring with them the most advanced technologies, China could be equipped with sophisticated managerial and technical know-how, and the technology suppliers would assist in selling Chinese products abroad to earn foreign exchange for China.

Another expectation of the Western technology suppliers that developed countries are obligated to share their technologies with the poorer nations as mentioned earlier in chapter two.

However, few American businesses realized such incompatible goals and different perceptions held by both governments and businesses of the international technology transfer. As a result, by 1989, foreign companies that set up operations in China found themselves unable to obtain the massive sales or the low cost production of which they had dreamed (Mann, 1989, p.24).

In addition, direct American investment comprises only about $1 billion out of a total $14.6 billion for all foreign investment in China, including offshore oil exploration (Pye, 1986). The total number of American business personnel and family members in China, by 1989, was 6,100 (Mann, 1989, p.306).

Correspondingly, Chinese leaders felt that they had
misjudged, too. Their own expectations of what Western businesses might do for China had proved to be unrealistic. By the late 1980s the relationship between Western businesses and China was clearly beginning to cool (Mann, 1989, p.306). American businesses were no longer so awed by the business prospects in China. China, with its current $10.4 billion foreign debt accumulated in the past ten years from technology importation, had begun to reexamine the extent to which it could afford reliance on Western technology.

It is not unfair to say that American businesses created the illusory image of the Chinese market, based on overly optimistic comments made by both governments. Another contributing factor was the "taken-for-granted" attitude of Americans doing businesses abroad, which is explained in the following discussion.

**Unmatched business practices.** The two cases discussed earlier indicate that Americans businesses had little understanding and knowledge of the crucial roles China's bureaucracies played. It was beyond their expectation that the entire transfer procedure would be in the control of different public bureaucracies, from allocating foreign currency for importation, to business negotiation and signing contracts. The end-users were out of the scene.

In the same way, Chinese public bureaucracy and the state-owned end-users were unprepared for the challenges
introduced by western technology suppliers, even though the economic reform was seen as a daring and radical assault on conventional wisdom.

One factor preventing the business practices from meshing was the unrealistic expectations brought on by incompatible goals. Each party wanted to follow its own established norm of conducting business. For instance, AMC expected to transfer its "way of doing business" to its joint venture located in Beijing. They invited the bureaucracies from Beijing to AMC's annual dealer show in Las Vegas. Instead of appreciating the marketing techniques displayed by MCA, the Beijing delegation accused AMC's president, Dedeurwaerder, of his "foolishness". The Chinese officials accused Dedeurwaerder of "wasting" the one million dollars on the dealer show which could have been invested in the joint-venture project in Beijing. By not doing the business the Chinese way, the MCA was perceived to be less sincere and enthusiastic in establishing the joint venture project. Dedeurwaerder, the offended by the mentality of the Chinese bureaucrats, finally spelt out his American way: "Listen, I won't tell you how to run your Communist system if you won't tell me how to run my company" (Mann, 1999, p.16).

Another incompatible goal is illustrated by a comment made by an Americans executive doing business in China. He complained that "the Chinese wanted our technology but won't
listen to our management advice. They wanted guns but not blue jeans, hardware but not software" (Hendryx, p.75).

Furthermore, American businesses place the highest possible value on economic efficiency, even if it may lead to differentials in income or unemployment. Their Chinese partners, on the other hand, spent much more time on welfare problems, smoothing relationships inside and outside the organization etc. Compared to American management, the Chinese management have less delegated autonomy and independence in business decision-making. More often than not, the real power over individual Chinese business lies with officials in each level of bureaucracy such as, the municipalities, government ministries, or in the Party leadership.

Given the above stated incompatible goals and unmatched business practices between the American suppliers and Chinese recipients, what could be some alternatives for American businesses? How well could private corporations of the West survive the bureaucratic operations in the China market? The next chapter will conclude the present discussion with a focus on some dilemmas facing American businesses in the future.
Given the discussions so far on the US-China technology transfer operations, what could be some alternatives for American businesses who want to be or have been involved in the China market? How likely and to what extent will the two economically and politically different systems (different beds) be able to work together toward their goals (overlapping dreams)? The rest of the paper presents some future options conceived by American and Chinese academics. I will conclude my present study by discussing some of the dilemmas facing American businesses in their future interaction with the Chinese public bureaucracy.

American Perspectives

Current discussions concerning the US-China business operations show different attitudes toward the future. One alternative is a full-scale withdrawal from the China market. This is recommended by some American consultants specializing in Sino-US technology transfers (Fischer, 1988). Another solution favors a "wait-and-see" approach. Some American companies already located in China, such as AMC, have stopped further investment and will let time take care of the procedure.

Their strategies are supported by three arguments. First, China is still a nontraditional market even with its
current economic reform since the market mechanism is replaced by administrative control from the central government and public bureaucracies. This centralized and bureaucratic system is not quite as receptive of Western technologies as it has portrayed to the world (Lieberthal & Prahalad, 1988).

Second, although China seems malleable from its self-imposed image to the West, its inside bureaucracy is intractable and endlessly capable of frustrating change (Mann, 1989). Its impenetrable "red tape" has caused financial loss to Western private businesses (Fistcher, 1988).

Thirdly, some American companies having gone through the Chinese bureaucracies for business operations feel the formula "2+2=1/2" is symbolic of a typical technology supplier/recipient relationship. It costs twice as much and takes twice as long in China to make half the normal profits made elsewhere (Johnston & Li, 1988).

It is also predicted that future technology transfers from the United States are difficult. Dennis F. Simon of Tufts University's Fletcher School of Law and Diplomacy, also a technical consultant with both countries, believes that it is not the right timing for China to transfer technologies from the United States. According to him, "China's desire to establish its presence in the world economy by using imported technologies is occurring at an
unfavorable time because developed countries such as the United States take security interests into account and increasing global competition has made some firms shy about releasing their technology to potential competitors" (Dai, 1988, p.59). Others like Richard H. Holton from the University of California at Berkeley, conveyed the notion that unless China improves its business environment, such as removing bureaucratic obstacles from future business transactions, the American practitioners are reluctant to return (Dai, 1988).

Others take a doing-nothing-approach. They believe that what Americans have encountered in China, such as bureaucracy, foreign currency problem, unstable environment etc., "are not necessarily unique to China. They are, rather, part of the political process of capitalism mixing with communism," and "a similar conflict might well be found if Western companies start up Joint ventures in Moscow or Leningrad" (Mann, 1989, p.308).

**Chinese Perspectives**

One problem seen by some Chinese academics in the US-China operation is that there has been a lack of mutual understanding and respect for the cultural, political, and economic differences between China and the United States. They also recognize that although businesses from both countries have been in active interaction in the past ten
years, "the effect of the last three decades isolation in the "cold war" still exists," and "one's market system, business customs, sales channels etc. are still foreign to the other" (Dai, 1988).

Other Chinese specialists hold a positive view for the future expanding of the technology transfers from the US to China. According to them, the American businesses have a high reputation for the technologies China urgently needs, such as energy, transportation, telecommunication, and basic material industries (Dai, 1988). Other Chinese believe that Americans should not give away this market of "cheap labor cost" to Japan and European Economic Market.

Chinese leaders made some positive gestures as well. A reform-minded Chinese vice premier, Mr. Tian Jiyuen, made the following candid speech to the American businessmen and academics who were attending the Sino-American Economic Cooperation Seminar in July 1988 in Beijing.

Each of us two nations has its own strength and great potentials for further cooperation. There exists a promising future in fields of manufacturing, investment, and high technology. We, Chinese government, are not trying to rationalize our unsatisfactory investment climates such as poor services low efficiency, red tape etc. Those problems, however, are what we inherited from history, from the legacy of the existing administrative system. It is not that we Chinese are no smarter. As a matter of fact, it is our goal and endeavor to make change of the existing low-efficiency-system and to introduce mechanisms of competition to every field (Hong, 1988).

Apparently, both sides recognized the problems in the
past and opportunities in the future. However, there also exists dilemmas that hinder the accomplishment of each other's goals in the future.

**Future Dilemmas**

Despite dramatic changes in economic areas, China's bureaucratic system remains unchallenged. The fact is the twelve-year-economic reform (1978-1990) has not changed the fundamental nature or structure of China's economic system. The state planning apparatus remain firmly in place. The economic changes are unable to go as far as the Westerners have hoped. To American businesses, it means that they are to encounter the following similar situations as they or their peers have done in the past ten years.

First, business opportunity and political instability are intertwined in the China market. Usually, a predictable stable political environment is one of the key variables that influence technology suppliers' marketing choice. For instance, foreign investment in China was strictly decreased in 1987 when China launched a political campaign against its intellectuals. However, the Chinese government has developed varieties of favorable terms to attract foreign technology suppliers even after the Tian An Men massacre of June, 1989. China can not afford not to adapt advanced technologies in its economic recovery.

Second, conflicts between efficiency-oriented American
private businesses and process-focused Chinese public bureaucracies will resume. It should be recognized that Chinese public bureaucracy has been ruled by the Communist Party for four decades. Therefore, public bureaucracies are accustomed to accommodate their operations to political ideology rather than to economic needs. Within such a nontraditional market system of China, American businesses will have to take advantage of any seemingly favorable situations. For example, when the Chinese government is reform-oriented, its public agencies tend to be more economic-efficiency oriented. In general, regardless of political situations, the bloated bureaucracy continues to overregulate everything within its reach in China.

The third dilemma shows that competition will be continued between newly established task agencies, such as the Tianjin Center in the second case, and structured governmental bureaucracies in attracting foreign technology suppliers. Specifically, the national government spells out tasks that various subordinate units are supposed to do. However, the fragmented subordinate agencies may have the task done not according to administrative laws or regulations, but through negotiations between the central and local governing bodies, and between government departments and subordinate enterprises. To Western technology suppliers, it will mean more confusion and expenditure of time and energy. It will be the Westerners
responsibility to figure out which agency has the decision-making power and who tends to be more productive. This dilemma brings forward another difficulty.

Finally, business and personal relationship are always overlapping with each other in China's business environment. Americans who are accustomed to abiding business codes and laws find it difficult to accept and accommodate. However, due to the Chinese cultural norms, plus the scarce material supplies needed for production, the development of personal relationships with bureaucracies and bureaucracies becomes an indicator measuring business success. In some case, what may seem to be bribery to Americans might be an accepted business ritual or a fringe benefit to a contract.

As compared to American bureaucracy, the Chinese public bureaucracy has autonomic power over individual business. Such power breeds privilege and is not easily abandoned.
CONCLUSION

In international market, American technology suppliers seem to be naive in business operations when compared to others such as the Japanese. However, Americans have impressed their Chinese partners with their integrity and sound business credit. The following comments made by the assistant manager of Tianjin Center (case 2) illustrate the reasons:

Under similar conditions, we would rather enter into business with American technology suppliers. Not only do they provide quality technology but also demonstrate integrity in doing business. Generally speaking, they are honest, straightforward and ethical as compared to some Japanese technology suppliers. An American 'yes' means it and a 'no' excludes tricks or mind games.

In addition, because American businesses value their credit, they would not dump inferior products or technology to their Chinese customers for short-term profit. In this sense, American businesses are more ethical and long-term oriented than Japanese technology suppliers in the Chinese market (F. Li, personal interview with assistant manager of Tianjin Center, June 10, 1990).

The question is what could Americans have done to better use the advantages and positive images they have established in the Chinese market? Furthermore, what strategies can American technology suppliers employ in their future operations in China to better survive China's public bureaucracy? The author, based on the case analysis discussed earlier, her past work experience with Chinese public bureaucracies, as well as American technology suppliers and selected literature research, suggests the
following coping strategies for American businesses who want to sell their technologies to Chinese customers.

A. Seeking Cooperation from U.S. Governmental Agencies

What makes American private businesses successful at home, such as their "lone wolf" strategy, may not be receptive in an environment where public bureaucracy and state-owned enterprises are of prestigious status. Having American individual business dealing with the layers of Chinese public bureaucracies is like a single soldier fighting a whole battalion, or a curiosity-driven child getting lost in a "mystery palace".

The rationale of encouraging the evolvement of American governmental agencies in the Sino-U.S. technology transfer is three-fold. First, business communications between same level public agencies, such as between the Department of Commerce in Washington D.C. and the Ministry of Trade & Economic Development in Beijing, create an atmosphere of equality, sincerity and mutual trust in business transactions. China, a more hierarchical society than the United Stated, emphasizes formality, courtesy, ceremony and cultural rituals in international business operations. Moreover, China is not yet accustomed to the market mechanisms such as the existence of private business. It is common and acceptable to the Chinese public that bureaucracies, especially those empowered with decision-
making autonomy, enjoy privileged status over private business and carders (bureaucrats) versus business people. Similarly, state-subsidiary enterprises are superior to collective-owned or private businesses.

Another rationale behind is that the concept and practice of private business have not yet been well acknowledged and accepted by the Chinese public. The practice of private business had been eliminated and forbidden until early 1980s when the current economic reform was expanded to urban industries. Given this historical factor, it is not uncommon that the existence of the private business or entrepreneur provokes the image of "profit-seeker" while Chinese public agencies are that of "office-seekers".

The third rationale lies in the assumption that, by utilizing specialized governmental agencies in business coordination, individual American technology suppliers can minimize their administrative costs and personnel input in the Chinese market.

Governmental involvement can take many forms. Instead of having each individual business go to explore and deal with layers of Chinese public bureaucracy, an American governmental agency may operate a liaison headquarter in China to coordinate Chinese public bureaucracies with American individual business. The Japanese has used such strategy to fit into China's political and economic
structures in order to achieve their economic goals. For example, during the mid-1980s when China's economic reform was at its prime, a business representative from the government of Kobei, an industrial city in Japan, was sent to Tianjin, the sister city of Kobei. According to the representative, his major responsibility was to coordinate private Japanese businesses from Kobei in their transactions with local Chinese public bureaucracies. He functioned as a liaison, public relationship agent, information collector and, above all, symbol of Kobei. The Tianjin government, in turn, offered favorable business terms to the Japanese businesses (F. Li, personal conversation with the Japanese representative in Tianjin, China, May 26, 1985).

B. Targeting the Right Chinese Public Agency

What differs the business practice between the Grand's team (case 1) and the BurryKing's (case 2) in their Chinese operation is that the latter, instead of following a routine bureaucratic procedure, targeted an efficient functional public agency. The writer summarizes three major indicators that help American technology suppliers to identify and distinguish from a right public agency to an inappropriate one.

Profile of science & technology committee. First of all, the target agency should be within the system of China Science & Technology Committee (CST, located in Beijing).
In another word, if the target agency is a branch or subordinate of CST, such as the local science and technology committee institutionalized in each major industrial city, redundant procedures can be minimized due to the advantageous position of CST in China's economic reform.

One of the favorable situations for CST and its branches is, because of their expertise status, technical competence as well as their adversary and functional relations with key governmental agencies, they are delegated more autonomy and decision-making power other eligible agencies mentioned earlier. In the second case, the technical branch of CST, Tianjin Science & Technology Committee has its autonomy to import BurryKing's technology through its task agency, Tianjin Center.

In addition, a local science and technology committee, a direct subordinate of the municipal government, usually has the delegated authority in the management of human resources and business activities. For example, Tianjin center used the support provided by Tianjin government, its mass media, personnel staff, etc., to organize the information conference where American technology suppliers and potential Chinese end-users were introduced.

Profile of local public agency. The second indicator underlines whether the agency has the informal power to influence executive decision-making procedures and outcome. It is equally important that it is delegated total
implementation authority. The second case illustrated that it was the task agency, Tianjin Center, that actually took the initiation to import the technology, conceived sound proposals and alternatives for its executive agency, TSTC. The task agency concluded the transfer by itself on behalf of both TSTC and individual technology recipient (F. Li, personal interview with the assistant manager of Tianjin Center, June 10, 1990).

Profile of public agent. The third significant measurement of a right choice is whether the agency has an influential and all-round performer. It is typical, when operating in the Chinese business environment, that a smooth and harmonious personal relationship with key bureaucracies can make a transaction far more efficient and effective than simply following written rules. According to the assistant manager of Tianjin Center (F. Li, personal conversation with the assistant manager, June 10, 1990), such a "Mr. Right" agent should demonstrate competence in, at least, the following three areas.

The agent, apart from personal integrity, needs to be in the management position of the agency, preferably next to the executive manager. In most Chinese organizations, the management next to the executive, i.e. assistant manager or vice manager as the Chinese call it, is usually held accountable to business operations and business decision-makings. The executive manager is responsible for overall
accountable to business operations and business decision-makings. The executive manager is responsible for overall organizational planning and personnel.

Apart from holding a management position, the agent should demonstrate the capability of initiating business proposals with sufficient expertise knowledge of the technology being imported. Also required is the agent's familiarity with bureaucratic operations. Take the second case for example, the assistant manager of Tianjin Center, holding a science degree in engineering, was capable of conducting feasibility studies before presenting his importation proposal to TSCC and Tianjin government.

Finally, the agent must be a veteran public bureaucrat able to smooth operations among superior, parallel and subordinate public agencies. The past work experience in the public bureaucratic system will enable the agent to get around unnecessary agencies.

In short, a public agent, possessing the above stated three qualities plus English proficiency, will have considerable informal influence on Chinese bureaucratic decision-making procedures and outcomes.

C. Discovering Informal Information Channels

Americans, accustomed to formal information channels such as governmental regulations and business codes, may find the formal channels in the Chinese environment less
functional than what they have assumed. In the field of technology transfer, the formal channels are characterized by structured organizations and their stated functions as described in chapter two.

One contributing factor to the American business' ignorance of Chinese informal channels is their valued "American way". According Grow's (Grow, 1988) cross-culture research, about 72% of the large American firms surveyed sought information from the U.S. Department of Commerce to make their China operation decisions. Moreover, American managers took for granted that administrative decree or bureaucratic fiat would "untangle the Chinese web of rules and regulations" (Grow, 1988, p.31).

The American way exercised by the Grand's team (case 1) was to rely solely on information provided by the technical agencies. Without using informal channels, they were kept in the dark regarding the pricing and negotiation procedures until two years later. Their Japanese counterparts, however, took every opportunity to socialize informally with end-users, related bureaucrats, agencies concerned and even decision-making personnel in order to collect inside information and thus try to influence decision-making.

BurryKing (case 2), on the other hand, employed a bilingual American Chinese to develop human relationship with Tianjin Center. With the informal relationship healthily established, BurryKing was able to trust and be
dependent on Tianjin Center for its suggestions and management. In turn, BurryKing's effort of using informal channels was rewarded with an extended contract.

Informal channels in the context of China-Western business operations can be identified as the following: (a) what is not said in formal business negotiations; (b) information unavailable from public record but from key bureaucrats or business translators; (c) advice, suggestions and interpretation provided by an individual agent; (d) personal relationship with end-users and a key agent; and (e) information in local newspapers.

Informal information channels are especially important to Western technology suppliers because of the instability and constant change in China's current transitional phase from government controlled economy to market economy. American businesses, in their endeavor to discover and make full use of the informal channels in their Chinese business operations, will face challenges from their language and cultural disparities as discussed in the following.

D. Acquiring High-Context Culture Communication Skills

Americans are proud of and highly value their individualistic-oriented behavior and the pursuit of openness, fairness and equality in business competition. However, Americans are perceived to be naive in doing so in some "high-context" cultures such as China, Japan and Korea.
The high-context culture in business communications, especially between foreign businesses and local Chinese businesses, is featured by indirectness, vagueness, formality, courtesy and others-oriented. The negotiation style used is more receiver-oriented than sender-oriented as it is the listener's responsibility to figure out the hidden meanings implied in the sender's message for the sake of saving face.

Low-context culture, as that of American and some European countries', is identifiable through (a) the explicit and precise communication as if between man and computer; (b) the speaker-oriented negotiation style which holds the message-sender accountable for the accuracy of message; (c) the obedience to laws and business codes; and (d) standardized measurement of business performance.

Influenced by their low-context culture, the American business in the Chinese market tend to repeat business practices exercised at home. For example, they may take for granted that by investing costly in advertising, they will be able to market their first class technology in the Chinese markets. Their Japanese rivals would invest equally in advertising and human relationship building because they are better aware of the fact that "the Chinese top decision-makers are not interested in reading or watching advertisement while the interested (i.e. end-users) has no decision-making powers over importation and foreign currency
allocation" (F. Li, personal interview with the assistant manager of Tianjin Center, June 10, 1990).

In the transfer of foreign technology to China, a Chinese technical agency would explore all possible means that are not spelt out in written forms instead of following what has been imposed by the government. When governmental policies favor market economy, the Chinese would run as fast as they could as if rushing through the green traffic light. Accordingly, they would try every means to get around instead of stopping when the light turns red. Put it another way, governmental policies and business codes respected by Westerners can be interpreted differently or got around by local Chinese agencies or agents without being caught.

The above described business behaviors in high-context cultures is true to East Asian countries such as Japan, Korea, China, and some Middle East countries (Chu, 1989; Jin, 1989; June, 1989; & Li, 1990). The following statement conveyed the frustration experienced by some American executives doing business in China. It also indicates that some cultural rituals considered to be the "prerequisite" by people from a high-context culture for further business operations are not yet receptive to Americans.

When doing business in China, we (Americans) notice that Japanese frequently propose toast (the cultural rituals practiced by Japanese to promote warm human relationship prior to business negotiations) to their Chinese clients. We have no clue what those Japanese are up to. We see Chinese holding banquets for us from the beginning of our business negotiations to the end and we
know more often than not nothing may be accomplished. We Americans do business first and "Gan-bei" (proposing toast) in the end (Li, 1990).

To conclude this study on the Chinese bureaucratic behavior in technology transfers, the writer advocates an incremental reform of China's public bureaucracy. The existing system does not encourage the transfer of foreign technology, which has hindered China's further economic development. However, before such an ideal revolution occurs, American businesses have to develop strategies so that they can, as suggested in a military strategy conceived by General Sun Tzu in 500 B.C., "know yourself, know your rivals, hundred battles, hundred victories" (Chu, 1989).
References


