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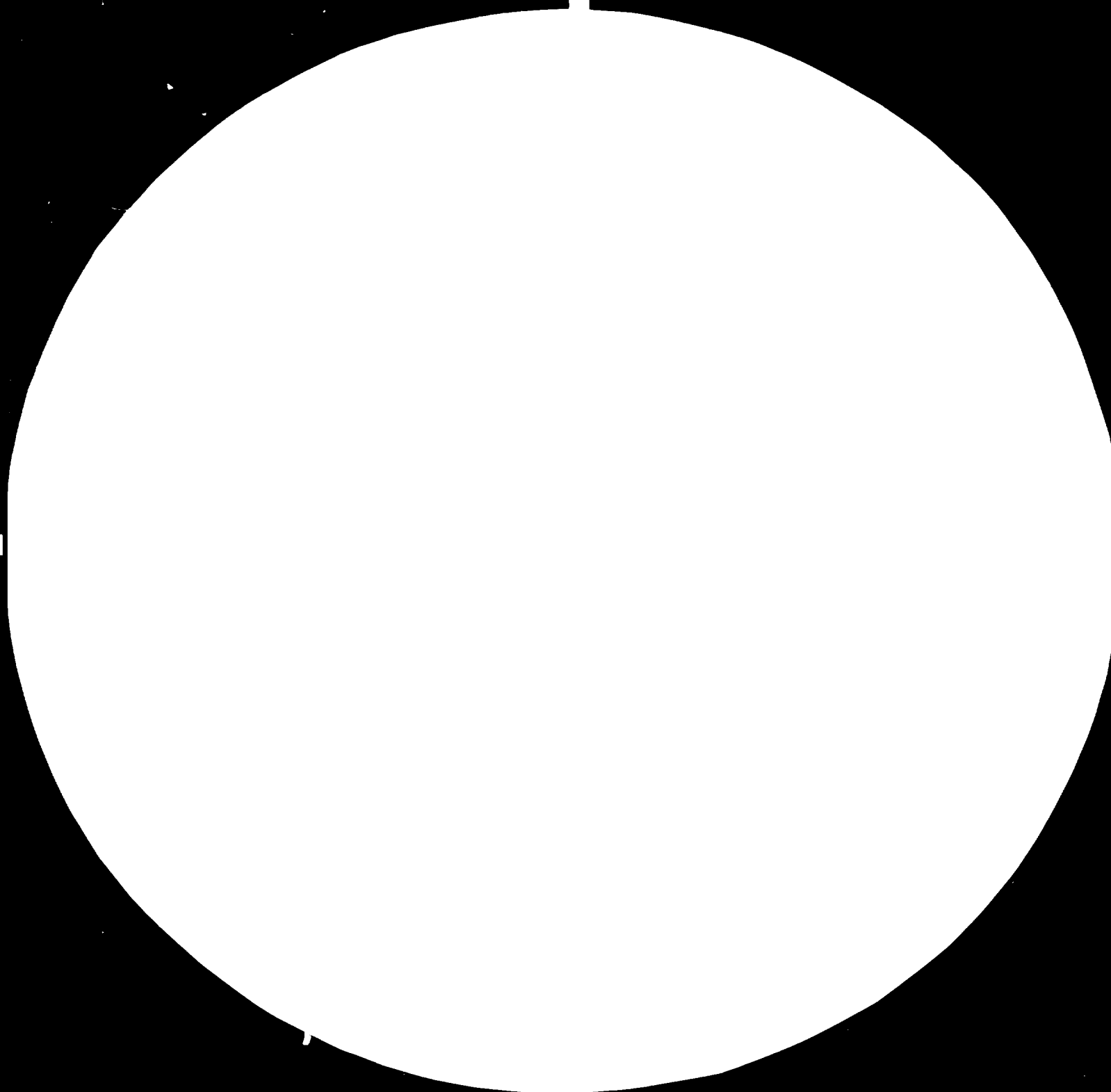

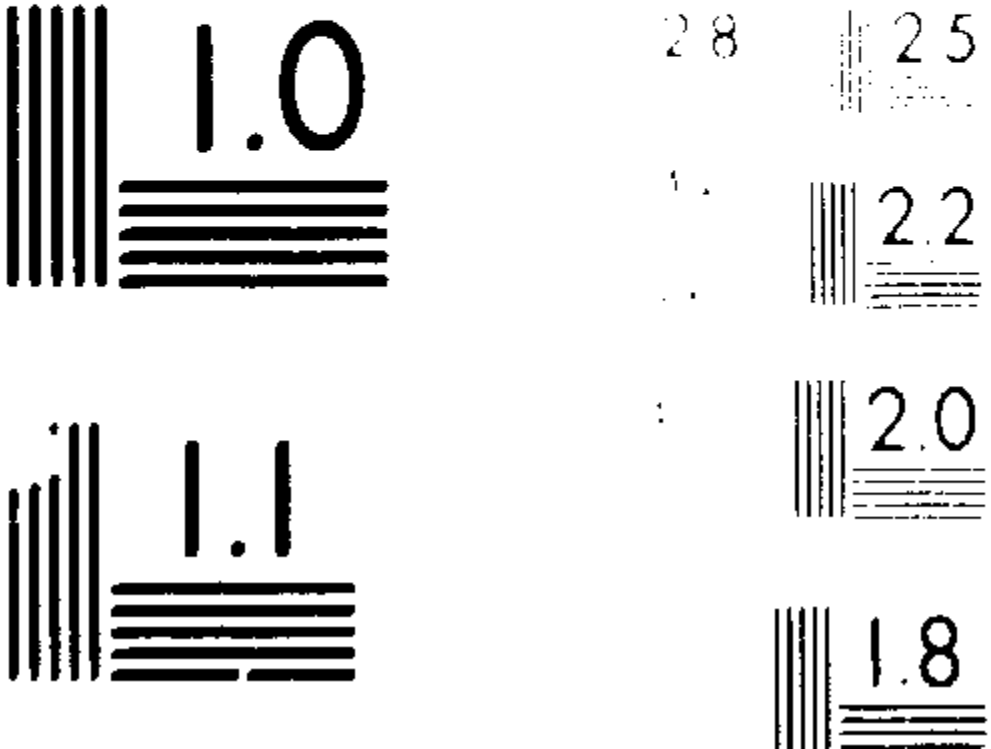
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REPORT ON THE PROJECT

SI/CPR/80/802

INDUSTRIAL MANAGEMENT DEVELOPMENT ADVISORY MISSION

INCLUDING SEMINAR FOR TOP EXECUTIVES *

Prepared by

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I. INTRODUCTION

This project originated from a request for technical assistance by the Government of the People's Republic of China to the United Nations Industrial Development Organization. A total number of 16 projects were requested in June 1979, one of which was the request for technical assistance regarding the development and strengthening of industrial management capacities of the country. During the UNIDO programming mission to China in July 1979, this project was discussed in depth with officials of the State Economic Commission.

The project outline for this UNIDO mission was formulated and special financing under SIS was made available by UNIDO under the project number SI/CPR/80/802. Four high level consultants were entrusted to carry out a management seminar for top industrial executives, to analyse management problems in Chinese industry in general and to come up with suggestions on how to approach industrial management development.

This report summarizes the results of the above UNIDO project, which was implemented during September 1980 by

- Mr. H.L. Hansen, Team Leader, Consultant in General Management
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Without the friendly and open atmosphere and co-operation shown by all Chinese officials, the ambitious targets of this project could not have been reached. The superb organizational assistance provided

by the Research Institute of the Metallurgical Industries, Ministry of Metallurgical Industries deems special mentioning.

This report does not only reflect the findings of the consultants, but also includes recommendations regarding approaches for industrial management development in the People's Republic of China.

II. OBJECTIVES AND LOGIC OF THE PROJECT

Industrialization in the People's Republic of China is rapidly increasing and the Government recognizes that further rapid, well-planned industrialization is essential for raising the general economic level of the country. At the same time, however, Government officials are aware of the fact that the development of managerial expertise has not kept pace with the industrialization programme, and they consider that there is a great shortage of experienced industrial managers at all levels. A very strong cadre of industrial managers on a very broad scale has to be developed as quickly as possible. To this team's knowledge, there has been no previous comprehensive study or report by a UNIDO project team on how to accomplish this end.

The development objective of the project was the improvement of industrial managerial capacity in the People's Republic of China, and, consequently, the improvement of the industrial performance throughout the country by the optimal use of resources. The immediate objectives were: to provide an overview of modern industrial management tasks, responsibilities and practices; to assess immediate, specific management shortcomings; and based on the above, to formulate possible approaches on how to introduce modern management practices into Chinese industry as fast as possible.

The activities visualized for the project were in general carried out and sufficiently so, to achieve the immediate objectives: lectures on management subjects, visits to factories, discussions with management staff, and a review and discussions with Government officials. The activities of the project team, its findings and conclusions, and recommendations regarding management development are presented in the following chapters, with additional details provided by each expert in the respective Annexes.

A concise description and analysis of historical events leading to the present state of industrial management in China is given in Annex I., which creates the framework for the body of the report and will provide orientation to other experts coming to China for the first time.

III. PROJECT ACTIVITIES

The project team went to Beijing to deal with a group of 20-30 participants and was confronted there with a group of about 250, mostly from metallurgical companies, primarily iron and steel, which again was not expected, and certain modifications in the planned implementation of the project need to be mentioned.

1. A Change in the Size and Composition of the Seminar Group

Some time and place between the original concept of the mission and its execution a change took place in the Chinese view of the mission. This is not surprising in view of the rapidly changing operating environment. It was originally envisaged that the attendants would number 20 to 30 "high-level national and provincial officials of the State Economic Commission, and managers of large, important factories".

At the opening session, the project team faced a seminar group numbering about 250, consisting virtually entirely of managers from companies falling under the jurisdiction of the Ministry of Metallurgy, and of officials from the Ministry. Discussions were immediately held on the possibility of dividing the group into four sub-groups, but this was not practical, and the seminar continued on a single group basis.

2. The Lecture Programme

As for the lecture programme, it followed that envisaged for the proposed mission, extending over two weeks. Topical coverage by the experts is given in Annexes II. through V. Two lectures per day were conducted, each lasting from 3 1/2 to 4 hours, allowing time for transportation and (limited) discussions.

3. The Problem of Lack of Questions from the Audience

The project team had anticipated that for cultural reasons it would be difficult to obtain questions and comments from the audience during or following a lecture and this proved to be the case. One or two questions might be asked on occasion, but it was impossible to maintain any continuing discussion. This was true even when, during a lecture, an audible ripple of conversation would go through the audience, suggesting the surfacing of a discussable topic.

The continuing suggestion of the local organizers was that of organizing small groups to encourage questions, but the project team members saw this as leading to the conduct of four separate programmes. Also, would "small groups" result? If the entire group were divided four ways, four 50-60 person groups would result, hardly "small groups", which would release the individual's inhibitions. Or if the groups were formed on the basis of interest, one might be faced by "large groups" and "small groups". Finally, while really small groups might

release some inhibitions, it is by no means clear that group size is the primary inhibiting factor.

This last conclusion can be drawn from the result of a later event resulting from the project team's determination to get questions. The team decided that one way to remove all inhibitions from the individual traceable to the presence of other persons in the group was to ask the participants to submit written questions to be turned in at the end of the first week. The small number of questions, about two dozen, that resulted from this invitation to a group of close to 250 managers when peer pressure was removed, suggests that many of the participants may not have had the background to know what kinds of questions to ask.

Unfortunately, not all the questions submitted were preserved but those on General Management were. They tend to be of a very broad nature and are repeated here unedited:

(a) - How to be a good manager in an enterprise?
- What kind of questions are those managers in the Western world take into consideration?
- What routine work is under their leadership and supervision?
- How does a manager display his wits and experiences and how does he organize his staff to realize the enterprise goal?
- Is it possible to give an example to introduce the actual work content, method and effectiveness of an enterprise manager?

(b) - What are the important characteristics of the enterprise management in the Western world?
- What are the common methods for their management?
- Is there any new development in management and what is the prevailing tendency?
- What are the effective theory and method on management in the developed countries? Please give your comments on their advantages and disadvantages.

(c) - What are the principles and methods in making decisions?
- How is it applied in the practice of management?
- Is it possible to give an example to show how to make decision analyses and superior and sub-superior strategic decisions according to the various forecasts?

(d) - How to make market studies in the Western world?
- Give one example to show how to raise competitiveness of goods and increase market share by applying sales information system, sales analysis and making up sale decision.

(e) - How to run an asscciated business and multi-business in Western countries?
- How to draw dividing line of the respective responsibilities? What are the necessary preconditions establishing an associated business and multi-business according to the current fact and currect experiences and what problems should be paid attention to?

(f) - How could an enterprise be successful to enter the international market?
- Is it possible to introduce some decisive experiences and methods?

4. The Company Visits

A modification of the project's programme in this regard was especially frustrating. The job description provided the project team leader read under paragraph 9(b) "visit factories to gain a first-hand impression of existing management systems and practices"; under para. 10, "second week; visits to factories and discussions with management staff"; under para. 11, "the visits to the factories will be arranged and organized by the Chinese officials who will also choose the enterprises and determine the number to be visited".

It is clear in retrospect that the project team in reading these statements dwelt on paragraphs 9(b) and 10, while the Chinese hosts dwelt on para. 11. But it seemed to the project team members in their first week in Beijing that in order to make useful recommendations at the end of their stay, they should get out of the lecture hall where they were telling what they knew and into the "field", where the factory managers could tell them what they knew. And, from a variety of sources, team members were urged that in visiting companies and plants, they should visit other parts of China away from Beijing, because there were regional differences in practices and attitudes.

The only field trip that appeared to have been planned on the team's arrival was one two-day visit to the Capitol Iron and Steel Works in Beijing. The project team could never ascertain what the real reasons were for this limited field exposure. As for moving out of Beijing, at first it appeared to be lack of funds for travel: then it was lack of communication time to make arrangements. Finally, a compromise was arrived at. The team's computer science member, Professor Kan Chen, was to travel to the Hangchow Turbine Factory where there were new computers installed and new concepts of production control in China being used. Also, it was agreed that the team members remaining in Beijing will visit an automobile plant and that the team member concerned with production management would make a visit to a machine tool company in Bejing in lieu of his visiting the iron and steel factory.

In retrospect, it was the project team's view that the lack of plant visits either in or out of Beijing did not provide the team the chance to gain sufficient first-hand knowledge regarding specific management deficiencies at the factory level, but on the other hand it enabled longer contact time with the seminar participants, most of who are practising managers, which was a compensating factor.

IV. SUMMARY OF PROJECT FINDINGS

The experts' individual reports are contained in Annex II. (General Management), Annex III. (Accounting and Financial Management), Annex IV. (Production Management) and Annex V. (Computer Applications in Management). For the reader's convenience, brief summaries are given here:

1. General Management

General maragement in the Western sense of meaning the direction of the business and of the common business functions of production, finance and marketing, as well as other functions such as control, purchasing, and personnel, has not existed in the People's Republic of China because of the centralized planning system which has assumed important decision-making roles. The new economic policies announced in August 1980, however, are going to require firms to begin to be concerned about their strategic direction and to make functional, integrated decisions formerly either not necessary nor possible.

2. Accounting and Financial Management

The general impression is that accounting data are generated as an end in themselves rather than to assist management in decision-making. There are three distinct groups for whom increased understanding of accounting and control would be useful: enterprise planning officials in the State Economic Commission and Ministries, enterprise general managers, and enterprise accounting staffs. Detailed suggestions as to the programmes for these groups and methods of instruction are contained in Annex III.

3. Production Management

There is a contrast of mind, of character, and courage to act between Western management practice and the situation in China. There is a liking to learn the results of Western decisions and to copy experience, but Chinese managers must think through problems and come to their own conclusions. Foreign language training is much needed to enable Chinese managers to visit and learn from the industrialized countries.

4. Computer Applications in Management

The industrial use of computers has taken a different direction in China than in the West. Computers are regarded as technical tools for production rather than as tools for accounting and management. The larger manpower pool in China makes the use of computers for production automation less important than the use of computers for timely management information and for the economic rationality of management. In order to guide the use of computers toward assistance in managerial decision-making, both top management and technical people need training but of a different type. This trainign should not only be in the classroom but should involve the study of computers in action. To foster computer utilization, it is recommended that a Consultancy Centre for Computer Utilization for Industrial Management be established. Foreign experts should continue to be sent to China, and the Chinese hosts can aid these experts by providing them with certain orientation materials.

5. Results of the Seminar

A direct measure of achievement with regard to the seminar is given in Exhibit 1. on the following page. The exhibit contains the results of a questionnaire, distributed and completed on the next to the last day of the seminar. It gave overall insight regarding:

- the intent of the participants for applying the learned material in practice (very much 42%, moderately 54%);
- subject interests (very much for general management 86% and distribution management 83%, followed by financial management 54%, production management 49% and computer applications in management 37%);
- the high demand for all types of management literature (over 90%);
- the need for a special computer training facility (75%);
- the desirability of such seminars in a modified form, with equal time allocated for general lectures and special lectures (very much 60%, moderately 18%);
- the total desired time of such seminars (4 weeks).

Regarding the availability of management literature, it was found that this is being already partially satisfied, as the list of management-related publications in China indicates (Annex VI.). The subject matters covered are quite broad, as the translated index pages of 3 issues of the Business Management (Quarterly) illustrate (Annex VII.). The problem seems to lie with the "easy accessibility" to such literature by industrial managers. Surely this situation will quickly improve in the future.

EVALUATION OF MANAGEMENT SEMINAR QUESTIONNAIRE

Group based on Job Function		Question (a) No.	Opinion in %												Average No. Weeks				
			1	2	3	4 a	4 b	4 c	4 d	4 e	5	6	7	8	9 a	9 b	9 c	9 d	9 e
OVERALL (120 questionn.)	VM	(b)	41	69	42	86	49	54	37	83	97	75	96	94	2.3	1.9	2.0	1.8	2.4
	M	(c)	51	18	54	13	45	43	44	17	3	24	4	6					
	L	(d)	8	13	4	1	6	3	19			1							
GENERAL MGT. (35)	VM	(b)	43	73	50	85	52	52	35	80	94	74	97	94	2.4	1.8	2.0	2.0	2.0
	M	(c)	54	15	50	15	45	48	55	20	6	26	3	6					
	L	(d)	3	12			3		10										
PRODUCTION MGT. (35)	VM	(b)	40	60	34	79	55	57	39	81	94	81	94	91	2.7	2.3	2.1	1.9	1.9
	M	(c)	60	23	63	21	42	40	57	19	6	19	6	9					
	L	(d)		17	3		3	3	4										
FINANCE/ACC. (12)	VM	(b)	78	67	70	100	80	80	50	100	100	90	100	100	2.2	1.9	2.2	2.2	1.9
	M	(c)	22	33	30		20	20	50			10							
COMPUTERS (10)	VM	(b)	8	67	8	58	25	17	75	73	100	92	100	92	1.6	1.3	1.3	1.2	2.1
	M	(c)	50	25	75	34	50	75	25	27		8		8					
	L	(d)	42	8	17	8	25	8											

(a) 1. Knowing now what was in the Seminar, would you have attended it?
2. Would it be more useful to have part of the Seminar separated into special subject groups?
3. Do you intend to use in your work what you learned?
4. How much were the various subjects of interest to you? (a) general management, (b) production management, (c) finance/accounting, (d) computer applications in management, (e) marketing/distribution management.
5. Do you think there is need for management training of industry personnel in China?
6. Do you think there is need for a special facility for training in computer applications in management?
7. Do you think there is need for easily available management literature in China?
8. Do you think there is need for easily available management journals in China?
9. How long do you think such management seminars/training courses ought to be? (a) general management overview, (b) production management, (c) finance/accounting, (d) marketing/distribution management, (e) computer applications in management.

(b) Very Much
(c) Moderately
(d) Little

Questionnaire to Management Seminar Participants

You would do us a great favour if you would fill in this questionnaire, expressing your views but without giving your name and indicating only to which industry you belong and what your job function is. It is very important that these are your views only, therefore, please, do not discuss it with others before completing it. We are interested only in statistical data and we will let you know the results.

A. Industry/Organization to which you belong (mark only one):

Metallurgy ___ : Other industry (please specify) _____ :
Ministry ___ : Research Institute ___ : University/Teaching ___ : Other (please specify) _____

B. Your job function:

General Management ___ : Production ___ : Finance/Accounting ___ : Computers ___ :
Distribution ___ : Personnel ___ : R and D ___ : Teaching ___ : Other (please specify) _____

	Very much	Moderately	Little
1. Knowing now what was in the Seminar, would you attend it?			
2. Instead of everyone listening to all experts through the entire Seminar, would you find it more useful to listen to part of the Seminar on general management together and have separate sessions on the specific subjects, such as production, finance/accounting, computer applications, etc.?			
3. Did you find the Seminar useful in that do you intend to apply what you learned here in your work?			
4. How much were the various subjects of interest to you?			
(a) general management			
(b) production management			
(c) finance/accounting			
(d) computer applications in management			
(e) marketing/distribution management			
5. Do you think there is nee r management training of industry personnel in China?			
6. Do you think there is need for a special facility (such as an institute)where industry personnel could learn and practice (on actual computers) the application of computers in industrial management?			
7. Do you think there is need for books and literature on various management subjects to be easily available in the Chinese language?			
8. Do you think there is need for Chinese management journals to be available on a broad scale to industry personnel?			

9. How long, do you think, such management Seminars/training courses ought to be? number of weeks

(a) general management - overview
(b) production management
(c) finance/accounting
(d) marketing/distribution management
(e) computer applications in management

V. CONCLUSIONS AND RECOMMENDATIONS

The project team's conclusions and recommendations can be summarized as follows:

1. A series of seminars, generally similar to the one just completed, should be scheduled as soon as they are feasible over the next several years. (Note: the team has discussed the possibility of four, but the actual number depends upon Chinese requests and UNDP funds).

2. The mode used by the State Economic Commission of assigning the seminar to the Ministry of Metallurgy - which then gave the seminar to its staff college, which in turn provided the seminar facilities, and whose officers and staff assisted with local transport and arrangements - could be repeated for each of the large Ministries, and with other Ministries in combination where the audience from one industry would be too small. Participants should include company managers, ministry officials and teachers.

3. A continuation of the seminar type just concluded is important because it fills the short-term needs in China's effort to build the capability of its management people. The building of the resources and faculties of the planned graduate schools, and of the venture at Dalian, are long-term solutions to the shortage of trained managers.

4. The building of the faculties of these schools and institutions will take time, and it may mean a half dozen years at least before these organizations will have the quantity and quality of faculty to begin to attempt to train and develop middle level and senior level managers.

5. Given the immediate need of the People's Republic of China for developing industrial managers, it is clear that the means for doing this

must come from outside the proposed business schools. The seminars represent a short-term strategy that pairs well with the present long-term strategy.

6. Efforts should be made to extend the impact of the foreign experts beyond the seminars in two ways: (1) each expert should prepare a package of teaching materials well in advance that can be translated into Chinese; (2) the lectures and discussions should be videotaped so that along with the course materials the videotapes can be used and reused many times locally in a variety of situations. This approach means that while it will not be totally possible, effort should be made to keep the original team intact, and when this is not possible to use fill-in personnel who are in harmony with the materials and the approach. It also means team members must be selected well in advance, six months at least, and the seminar budgets must make provision for preparatory time of perhaps several weeks.

7. Linked to these seminars, either preceding them, or occupying the first and second days, or taking a similar period of time at the end there should be a special seminar for heads of companies. Experience will lead to a lengthening of this "Presidents' Conference". (Note: The team has been cautioned on the egalitarionism that pervades the recent past and present Chinese culture and would argue against a segregation of participants by rank. Yet it feels that if its objective is to teach and foster discussion rather than pass on information, a mix of organizational levels is inhibiting). Reaching the top-level managers of companies is important for overall success.

8. The project team has been impressed time and again during its field trips, its teaching, and the informal meetings with officials and informed observers, by the magnitude of changes that are required to change

management practice in China's business firms and plants. When a great change is required, it has to be initiated and supported by the very top of an organization. And, of course, it is vital that this person understands the breadth, depth, and essence of the change needed. Yet in China, as has been described in Annex I. Background of Industrial Management in the People's Republic of China, present top management has not been shaped by years of management experience, as this experience is known in the industrialized world. It is clear that the change in management practice has to begin with exposure of top management to modern management concepts, and this change initially has to be pointed to and nurtured by foreign experts.

9. The concept of a "tiered" programme consisting of two or three tiers needs to be explored. Exposure of top management is still understandably not enough to obtain change. While top management is necessary to sponsor change, senior and middle management personnel are those who will have to bear the brunt of creating change. Now it is reasonable that there are efficiencies in exposing top, senior, and middle management in any given organization to the same educational stimulus. First of all, these different levels of managers can refer back to more or less the same presentation of management concepts and ideas. Second, this leads to use of common "language" that facilitates communication. The implications of a word used such as "strategy", or "decision tree"; or what is meant by "limitations of the product portfolio approach"; or when an experience curve is relevant for forward planning, are more quickly and readily grasped.

10. The suggestion is that the training effort takes seriously the possibility of arranging an important part of its activities on a framework of two or three organizational levels. That is to say, a business firm would not detach a single person to attend a programme as is common today,

but would commit itself to exposing persons at three levels: top, senior, middle. There are different ways this may be done: (1) three individuals may be sent to three different programmes held simultaneously or in sequence; (2) some combination of individual attendance and group meetings and individual conferences; (3) other ingenious forms may occur. The suggestion, however, has at its content the training must be in organizational depth and not consist of irregularly appearing individual managers for training. The suggestion also contains the phrase "the important part of its activities" that implies this format of two or three level training is not the exclusive method.

11. Such seminars should last four weeks, as the participants indicated (through the questionnaire) to be the most desired duration. A strategic programme, always subject to tactical modification, would consist of a first week of general management lectures; two weeks of lectures on the functional subjects of accounting and finance, production, and computer utilization in decision-making; and a fourth week of integrative case studies. A change in the daily schedule could have the effect of increasing the possibility of questions from the audience and developing two way discussions. Excepting the first and last days, the week schedule might be as follows:

Monday through Friday

08:00 - 10:00	Lecture
10:00 - 10:15	Break
10:15 - 11:15	Group study and preparation of written questions
11:15 - 12:00	Lecturer discusses written questions
14:15 - 16:00	Lecture
16:00 - 16:15	Break
16:15 - 17:15	Group study and preparation of written questions
17:15 - 18:00	Lecturer discusses written questions

Experience also indicates that a considerable amount of flexibility, and willingness to adjust the schedule quickly, are necessary. It is good practice to always have a back-up lecturer ready because of either illness or a desire to interrupt a pre-scheduled line of thought.

12. Consecutive translation (preferably by the Chinese counterparts to achieve teacher training at the same time) is strongly recommended. This method was found beneficial during the seminar as it allowed longer absorption time for difficult and for the participants' very new materials.

13. Also, and most important, sooner or later it will become apparent that some institution or interested group will be desirable to build upon the results of the seminars and the growing interest in management. It appears that the State Economic Commission already has in mind such a body, and linking the seminars with it should be considered. There is need for a core effort, core in the sense that it is a continuing effort coming from an institution in being, an institution in China, that can build and sustain a teaching, research, and consulting strategy. Given the great magnitude of the problem, the interests of many individuals and organizations in China to improve management, and the willingness of many foreign individuals and organizations to participate in this effort, there is no doubt that the present flow of seminars, lectures, and conferences marking foreign assistance will continue. And this is good and desirable because it will bring many different points of view before those persons and officials in China who are concerned with management development. But it is not enough, because these seminars, lectures and conferences must have institutional roots. Otherwise, when those who conduct them leave China, as they do after relatively short stays of days, weeks, or several months, their efforts can be submerged again, wholly or in varying measure by a tide of past practice. And often when an effort has by its success shown it could mark a future direction, funds and sponsorship must be sought anew.

14. Looking forward to the gradual transfer of much, if not all, lecturing to Chinese, plans should be developed to have such persons attend the seminars, and where language permits, to be exposed to the "management thinking" of the industrialized countries. Actually, if the Western experts were to come from one institution, the Chinese counterparts should spend their time with these experts in the same institution. Given, however, the many conflicting demands on experts' time, it is unlikely that they can all be obtained from one institution nor perhaps is it possible that they all will be able to participate in each seminar. Nevertheless, to the extent it is possible, an effort should be made to send the Chinese counterparts to the same institution so they will be exposed to a "common language of management" - a point made earlier in connection with training and developing managers.

15. Finally, the urgency of the development of training of practising industrial managers must be reiterated in view of the enormous task ahead. This is of primary importance for accelerating China's industrial development, which cannot succeed without the cadres of successful, experienced managers.

Background of Industrial Management in the People's Republic of China

Mr. Harry L. Hansen
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1. A Historical Overview

In order to understand the magnitude of the management development task in China and to appraise China's optimism for the future, it is desirable to emphasize the management void that has existed in a difficult, social and economic setting. The following sketch is a composite account from various Chinese sources interviewed during the team's stay. The account is also included for the orientation of other experts coming to China for the first time. The purpose of this review is to indicate that in the turbulent political years since 1949, no tradition of management was able to grow. One can add that, as the country enters the 1980's, perhaps only 10% Chinese managers, which is probably a high estimate, have any formal management education. Many managers at the top came through the political ranks.

Before 1949, management under the Nationalist Government was not good and was corrupt. The industrial base of the Revolution consisted of small industry and handicrafts, such as electric motor factories, and small textile manufacturing establishments were more common, and management was backward.

After 1949, with the establishment of the People's Republic of China, the enterprises owned by individual and foreign interests, were taken over and, considering the difficult circumstances, management by the workers was generally well done. The First Five Year Plan began in 1953, a centralized way of management was introduced, and this was the beginning of centralized state planning as well.

Central management of the entire economy became the practice and the production of all enterprises was directed by the Central Government. All enterprises were subsidiaries of various Government agencies and ministries.

At the very top was a Planning Commission, determining what should be produced, where the materials would come from, and where the goods should be sent. At the factory level, little or no planning was used, so there was as much difficulty at the lower level as might be imagined there was at the top. At the end of two years, in 1955, there was a sense that this centralized planning would not work in a very large country like China with its great and dispersed population. Priority had been on heavy industry, especially iron and steel, and while initially this seemed reasonable, it did not correspond to actual needs as time went on. Yet it was worth observing that at this difficult time, the number of cadres was high compared to the number of enterprises in the country, and that the level and the status of management, possibly based on carried -over expertise, could be judged perhaps better than today.

The first attempted significant improvement of the plan by the Government was in 1958. This attempt was based on an article written by Chairman Mao concerning "The Ten Great Relationships", which discussed the conflict between central and local control, proposing more local control. But the article was published in 1956, and by the time of the Great Leap Forward Momement in 1958, the impatience and forced working within the Movement induced trends going in the opposite direction from the article's direction. At that time, the country's science and technology was seriously damaged. This, of course, had a great impact on the future of the Chinese economy (e.g. backyard steel making). Finally, the Government realized these mistakes and decided on readjustments. Starting in 1963-65, management and social order was reestablished. The Second Golden Age came, and the centrally planned and managed system was modified to fit Chinese concepts.

Then, unfortunately, came the Cultural Revolution, when any consideration of profit (i.e. production efficiency) was considered revisionist and irrationality prevailed. Factories became disorganized, departments in colleges that had anything to do with management or economics or statistics were closed, foreign language training ceased. The economy of China came to the brink of collapse, although in official reports, the word was of great harvests, exceeded economic goals, and greatly improved conditions.

After these trying times for the country, by 1976, China wanted to reverse its course overnight, and do it instantly, but it realized this was not possible. While high goal were set at the top, it was difficult for the managers to meet these, as work discipline was still at a low level. Consequently, goals were lowered while the workers became more performance-oriented.

As the 1970's ended, some conclusions were being drawn about the past: the country should strive for stability and steady progress; priority should be put on energy; with the energy problem resolved, manufacturing was thought to improve quickly since it was operating at very low levels of potential capacity. The bottle necks were, however, tremendous as transportation and communication were exceedingly backward. A good example was that coal was available in the West, yet there was little transportation to move the coal. Another was that of oil. After it was found in the Northern part of China, it was shipped in barrels by train since there was no pipeline.

In agriculture, mismanagement also prevailed, such as emphasizing on grain production at the expense of forestry and fisheries development. Where cotton, peanuts, and sugar cane could grow naturally, grain was planted. As a result, there was a lack of crops needed badly as raw materials for light industry, textiles especially. It was clear that a change in agricultural policy was also needed.

To sum up, as China enters the 1980's, one of the results of the great policy fluctuations of the last 20 years between various approaches of planning and managing the nation's economic machinery, was that the industrial managerial capacity of the country has been severely reduced. Since formal management development, education and training has practically ceased to exist during this time, the present managers of industrial enterprises and factories in China are ill prepared to cope with the requirements of the new environment of the "four modernizations", with emphasis on productivity and optimum resource utilization combined with delegation to a large extent of authority for planning and decision-making down to the enterprise-factory level.

2. Despite this Past Record, China is Developing Economically

While, after reading this brief record of the past, one could be inclined to discount any new output claims, be chary of believing forecasts, and wonder whether putting effort into management development in what has been a very unstable environment is worthwhile, it is now clear that the country is making sound progress in economic understanding of the importance of physical output and productivity.

(a) Competition is being Encouraged within the Planning Framework

At the Third Session of the Fifth National People's Congress on 30 August 1980, it was stated clearly that there is competitive fresh air in competitive policies.

The new environment the State is seeking to create, will require Chinese managers to emerge from operating in a centrally planned economy to one with marked competitive elements. The transition is going to require the breaking of old and comfortable habits and the assumption of new ones suitable for a competitive economy. Hence, the need for management training and development is inescapable.

Changes in both agricultural and industrial development are forthcoming. Rural areas have adopted measures to protect the rights of communes, production brigades, and teams to make their own decisions. Village fairs have opened up again and life is livelier. Industry is beginning to be concerned with matching production to demand. Marketing is stirring with organized sales exhibitions, and companies are beginning to develop their own distribution channels or to use agents on commission.

These and other changes were described to the above Congress as intended to rouse enthusiasm, improve management and increase profit, as the following quotation demonstrates.

> ".... all such experiments .... give expression to the principle of regulation through planning combined with the regulation of the market, the principle of taking into account the interests of the central and local authorities, the enterprises and the individual workers, and the principle of closely linking the material interests of the workers with the results of enterprise operation. This is to stimulate the enthusiasm and initiative of the enterprises and workers to improve management, increase production, and practise economy".

During the same conference, a number of important reforms and experiences were listed. A value added tax is to be tried in the machinery and farm machinery industries to solve the problem of double taxation. In 1981, some state-owned enterprises will begin to pay a business tax rather than turning their profits over to the State. Leaving a share of the profits within enterprises has been tried out in 4600 state-owned enterprises, representing 45 percent of the total output of all state-run enterprises, and will be extended. Enterprises using circulating funds allocated by the State, will be charged in the second

half of 1980, and beginning in 1981, they will be charged for the use of fixed assets on a trial basis. In 1981, the State will use bank loans instead of State appropriations for capital construction.

(b) China's Economy is Improving

The economic data presented at the Congress, comparing 1979 and 1978 figures, indicated agricultural output was up 8.6%; light industry 9.6% and for the first half of 1980 output was 24.2% over the similar period for 1978; heavy industry at 7.7% was increasingly more slowly with only a 6% in the first half year of 1980 compared to 1978; consumption, long suffering from a shortage of goods, improved with the rates between saving and consumption dropping 33.5% from 36.5% in 1978, and a drop to 30% expected in 1980. Impressive is the planned increase in the container handling capacity of China's ports. This is expected to increase fourteen times in the next five years from the present 50.000 to 100.000 containers.

3. Recent and Present Efforts to Develop Managers

As of the time of this mission project team members have heard an estimate that during the last two years some 500.000 (sic) cadres (e.g. plant managers, managers of medium size businesses, Government officials) had been exposed to some kind of management training. At one extreme, programmes of six months duration have been conducted by the State Economic Commission and the Chinese Academy of Social Sciences. The curricula have emphasized the theory of management in socialist countries which, incidentally, does not exclude the need to accumulate capital and consideration of ways to do it. It is reported that in Shanghai 16 colleges have started courses in management. At the other extreme in the provinces, teaching methods were likely to consist of tape recorded lectures. It should also be recorded that the different Government ministries concerned with specific industries have their own staff colleges and training programme.

Three to four new International Economic Management graduate schools are planned at Shanghai, Beijing, Kwantow-Canton and Wohan. In Beijing, the school is to have four centres: foreign language, management, scholarly exchange, and consulting. An English training class has already started. A master's degree, M.A., will be given to successful attendees of the two or three programmes taught by Chinese (The conferring of a master's degree by a Chinese university is said to be a revolutionary step). Faculty and programme planning are only in the very early stage. It is clear that these prospective schools, the efforts of which are not aimed at improving skills of present, middle and senior level managers, are not going to be useful in the short term in lifting existing management performance levels.

A step toward easing the management shortage has been taken with the creation of the National Centre for Industrial Science and Technology Management Development on the campus of the Dalian Institute of Technology in North-Eastern China. This effort is based on a protocol signed by the U.S. Department of Commerce and China's State Commission on Science and Technology. Three agencies are co-sponsoring on the Chinese side: The State Economic Commission, the State Commission on Science and Technology, and the Ministry of Education.

It is a small step, since the class in a programme lasting only 18 weeks will provide training to only 120, made up of 40 managers from industries, 40 Government agency staff and 40 Chinese university professors. With two programmes each year at the present intake rate, it would take four years to have an output of 1000 persons of which only 160 would be practising managers. With an annually revolving faculty of American professors, and major future funding dependent upon the United States, the Centre cannot be said to be a final and exclusive solution to China's management development programme. A multiplier effect is bound to come from the Chinese professors attending, but again with only a long-range effect. An interesting move is the Chinese Government's intention to establish two other centres, one designed and manned with Japanese help (Tienjin), and another with West German assistance (Shanghai).

General Management

Lectures and Comments by

H. L. Hansen

Consultant in General Management - Team Leader

A. Lecture Coverage

1. Business Strategy

Definition of strategies, goals, policies

Importance of strategy definition to firm

Characteristics of a successful strategy

Strategies at different business levels

Short and long-range strategies

Broad categories of information for developing a strategy: environment, resources, personal values, organizational structure, management style

Tests of strategy: acceptable risk, appropriate time horizon, internal consistency, workability

Strategy implementation: analysis, specialization, integration, reformulation

2. Long range planning

Action and strategic planning

Balancing practicality and creativity in planning

Linkage of budget and plan: content, organization, timing

Bottom up and bottom down planning

Entering or continuing in a business: business attractiveness relative competitive strength, consolidation attractiveness

Concept of a product/market share to profitability

The learning curve

A case study in planning using a matrix

A case study: The Norton Company, Business Strategy, Planning.

3. Management Development, Personnel, Motivation

Functions of a Manager: Setting Objectives, Organizing, Staffing, Coordinating, Motivating, Measuring/Controlling

Concepts of Motivation

Hierarchy of Motives

Job enlargement/enrichment

Problem Solving: problems, alternatives, criteria, choice.

4. Marketing and Innovation

Modern marketing concepts: market segmentation, product positioning, concepts of the decision making unit and decision making process.

5. Final Case Illustrating Concepts

Heuer-Leonidas: 1975 : a group presentation, Business Strategy, Planning.

(a) There will be four group presentations of Heuer-Leonidas/1975

(b) Each group is to present through a spokesman (or spokesmen) their analysis of the case. The analysis must give answers to these questions:

What is Mr. Heuer's problem (problems) ?
What alternatives does he have for dealing with this problem (problems) ?
What criteria should he use in choosing the criteria to solve the problem (problems) ?
Having chosen the alternative what should be his action plan for putting the alternative into effect?

(c) In analysing the case the group will want to think about the relevance of these areas:

The Environment	Resources	Values
Economic, social political	Managerial	Mr. Heuer's aspirations and attitude toward: Risk; Social responsibilities

It is from a consideration of the interrelationships of these three areas that the nature of the problem, the alternatives, the criteria, the choice of alternatives, and the action plan emerge.

(d) Because of the size of the group attending this seminar it is not possible to have everyone in a participating group. A number of participants will be picked at random to constitute the four groups.

(e) All other participants will constitute a "jury" who will at the end of the presentation vote for the best presentation.

(f) Presentations should last no more than an hour including questions and discussion with the listening audience.

B. Comments on General Management

This report on General Management is very brief because general management has not existed in the People's Republic of China in the Western meaning of the word. In the West the general manager is seen as one who by integrating the customary business function gives overall direction to the enterprises. This can be illustrated in this organization chart:

General Manager
(or President, Managing Director
Chief Executive Officer)

Marketing Production Finance Control Purchasing Personnel

(Vice-presidents, or Directors, or Managers)

Since the State has been assuming the Marketing role, and has provided both funds and raw materials, the Marketing, Finance, and Purchasing functions were not major activities requiring top management decision making. Since the objective was to meet production targets without close regard to costs the Control function was also underdeveloped. Consequently, General Management was reduced to meeting production targets relating to staff and workers' committees, and dealing with frictions and contradictions resulting from reconciling centralized planning with local operations.

It is clear that there is a great need particularly for general managers, for exposure to managerial thinking in the areas of business strategy and strategic planning. The conceptual scheme for this kind of thinking is illustrated in Exhibit 1. If one contrasts this with the following account of managing at a large steel works, one can see a great difference by what is not included in the account.

1. Capital Iron and Steel Works

The visit to the Capital Iron and Steel Works took one and a half days. We were greeted on our arrival by two vice-presidents, the Acting Chief Engineer and the Directors of Finance, Technology, Wages and Awards, General Dispatch and Planning.

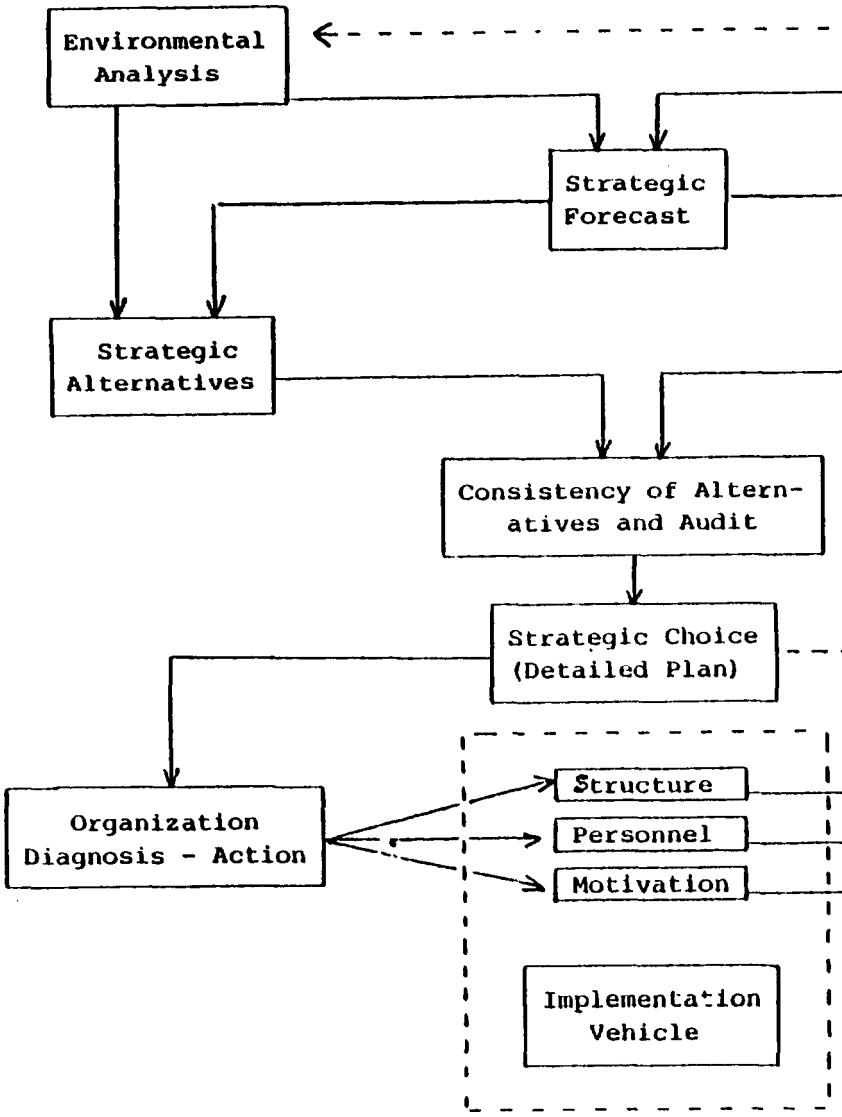
On the first half day we were shown how the works made steel, not how the making of steel was managed. Awaiting the tapping of the furnace, an accompanying official of the plant asked: "is it possible that management is a skill which can overcome technical knowledge and be common to different industries?. And later walking to a blooming mill another asked: "What is a manager?. Answers to these questions were put off to the next day for a discussion in a cooler and quieter place.

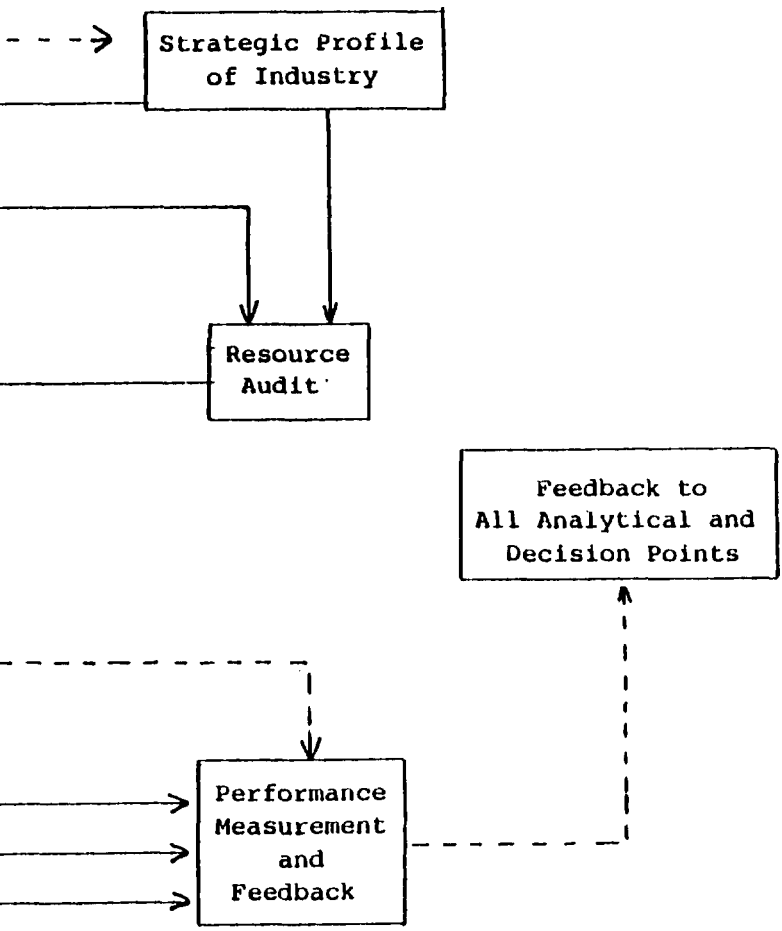
On the second day the meeting was taken over by the Acting Chief Engineer who gave the following account of the company. The total capacity in China is about 30 million tons. There are ten key iron and steel companies of which Capital is one. Of these, all have production over 1 million tons and Capital is the fourth largest producing company with approx. 3.5 million tons. Capital's management, however, regards itself as first in the industry in technical and management. Capital is a somewhat unbalanced integrated iron and steel company. From 12 million tons of crude ore the company gains 3.4 million tons of iron concentrate, and 3 million tons of pig iron, and about 500,000 tons of steel. Profits in 1979 were 20% higher than in 1978.

The corporate complex includes a mining company, capital engineering construction companies, a research institute, four schools and cultural educational units, two hospitals and nurseries. The company employs 60,000 persons of whom 9,200 are functionaries and 2,700 technicians

EXHIBIT I

STRATEGIC PLANNING SYSTEM




Strategic Profile of Industry
Resource Audit
Feedback to All Analytical and Decision Points
Performance Measurement and Feedback

and engineers. The company has two major organizational hierarchies, that of departments and sections, and that of plants or mines and workshops.

All strategic decisions are taken at the top of the company and implementation rests with the departments and plants and their lower units. There are 23 departments such as finance, economics, organization, and education; engineering, safety, raw material, supply, safety; personal industrial equipment. Plants number 21 and represent different production operations or supporting facilities.

The essential aim of the company is to satisfy the needs of the people in three ways: (1) to produce economically a product of fine quality to serve the needs of the country and the people; (2) to make profits to have funds for development and research; and (3) to have a plant that respects the community of which it is part and be pollution free and "garden-like". To fulfill all these the basic requirement is production, and to have production all people, all workers must have a will. But there is a problem. Much of the machinery and equipment date back to the 1920's, 1930's and 1940's so the company has great obstacles to overcome to catch up and overtake advanced levels of iron and steel production technology. Nevertheless, the company has achieved outstanding performance.

The company's attention has not been given to technology and production processes alone, but has been directed also to defining job responsibilities. The analogy to an army was used, that the general cannot do all, the work must be assigned to different levels. Suitable rules and regulations with defined job responsibilities are necessary. Also it is necessary to have figures and statistics to analyse situations and problems, to plan, to summarize, to have quality control, to apply linear programming. Still there is always much more to be done.

Since 1978 some 5,200 job responsibilities have been defined for functionaries. Applying the common sense idea that one should not only know what to do but how well to do it, 1979 has seen a vigorous effort to set job standards. Their effort began in 1978 in the steel making

plant to improve furnace heating. For instance, a brick maker should make his brick to a certain standard. In the past a job was accomplished by many workers, but only the leader took the responsibility. Now each worker at his post has a clear responsibility. The job responsibility descriptions were the joint product of the workers and the cadres. Now there is what is called a "3 in 1" system of standards, assessment and punishments.

Strategic decisions and planning, matters apart from the actual production operation have been done by the State, but the company is gradually gaining some independence. Historically 50% of the depreciation charge to the industry if 3.3% of sales has gone to the State. This has been changed, the rate being increased to 3.8% with the company retaining all the depreciation. However, whereas the State formally would make capital expenditure grants, now it is up to the company to finance its own expenditure of this type. There is some promise of the availability of interest bearing government loans in the future.

Independence has come in other ways too. Historically a profit bonus was given to the workers of 12% of the total wage bill. No matter how badly or well a worker performed he received 12%. "All eat from a big pot" was the descriptive phrase. But now this has been changed. Different percentages may be allocated to different plants or departments and the staff and workers committee concerned can make unequal distributions. Also the State will now allow 20% of any profit above the prior year's profit to be retained. This amount may be used to develop production including capital expenditure, used for collective welfare, and for awards to workers.

In summary, what the company has been doing is implementing the State's strategy. The company has had a decisive power on what it produces nor need it have been concerned with disposing of what it produces since the State has taken the output for distribution. This is now changing. Provinding the company meets its quotas it is free to do what it wants.

2. Peking Automobile Company

The other company visited was the Peking Automobile Company which produces Jeep type vehicles. The half day meeting was informative in what it demonstrated the absence of any conceptual view of management. Present during the interview were the Deputy Plant Manager and the Director of Planning, Coordination Accounting and Wage and Salary Administration. The three inputs were: (1) management is not a universal shell but is peculiar to a particular function or department; (2) management is something that one just does, it has no discernable structure, and (3) a statement by the Deputy Plant Manager about the elements of a general manager's job and the source of pressures upon him. This third point will be elaborated later.

With regard to the first of these three inputs, the project team leader began the business end of the meeting by explaining that the team was concerned with making some recommendations concerning the development and training of managers at the end of its stay in China. In order to do this the team was talking with company executives trying to discover what their interests or problems were so that the team's recommendation would be realistic and useful. The Deputy Plant Manager's reply was what management were we interested in, planning, production, maintenance, and so on. To which the team's reply was "all" and this seemed to bring the Deputy Plant Manager to an end-point as far as replying. Despite further trials no progress was made.

Since the managers present appeared to regard management as something peculiar to each department, and since obviously the Deputy Plant Manager could not be expected to be abreast of all department activities, it is perhaps not surprising that he had little to say. He did point out, as we heard frequently during our stay in China, that in the future a company would have to do more than execute the central government's plans for the company and be more than a production unit. One step he had in mind was to produce a line of "jeep" models instead of the one model being produced currently.

The Director of Coordination was drawn into the discussion by asking him to describe how he saw management, and what a manager did. He was unable, in answer, to get beyond saying that there were different department heads and that each "managed" his organizational area. But what the management consisted of he was unable to say. His view was like that of the Deputy Plant Manager. Management was a discrete thing belonging to a particular task. The fact that all tasks require objectives to be set to accomplish ends was not in his experience or knowledge. Yet one could not doubt that in the performance of his own work he pursued objectives but possibly under some other name.

The other person present was the Director of Planning and a special effort to draw him out was made. His work appeared to be mainly translating production targets into master department schedules and making sure that the various departments would be ready and would have the necessary skills and resources to carry out their part of the production plan. His work was quite different from what a manager in an industrialized country, where the Director of Planning is generally concerned with relating the company and its external environment. In the Chinese situation this has been done for the company by the government. The government tells the company what to produce and then takes it away after manufacture. The Company has no marketing effort.

At one point in order to draw out the Director of Planning, the project team leader mentioned that a recent conference had been held of planners from large European companies. Since planning in the automobile company might increasingly go beyond integrating the internal departments of the company in a plan he, the team leader, would be glad to talk about this conference or answer any questions about views expressed during it. This, however, brought no response.

The same neutral (negative is too strong a word) came from the Director of Wage and Salary Administration. At one point, reference was made to a study reported in the New York Times of what motivates Chinese workers. After mentioning a few of the motivating factors reported, reference was made to some of the motivating factors for American workers reported by a well-known industrial psychologist, Herzberg. It was suggested that perhaps there might be considerable overlap between Chinese

and American workers with regard to motivation. What was the Director's observation on what motivates Chinese workers? Again not much was forthcoming, and it was not clear whether this was because the question placed the Director on unfamiliar ground or whether the situation might have had political implications.

The Deputy Plant Manager did make two interesting statements. The first statement was that the manager presumably, especially the general manager, must see his job in terms of political, administrative (e.g. rules and regulations) and economic terms. The second statement was that the general manager had to give close attention to these pressures, one from the Government, another from the Party, and the third from the staff and workers. Are these three groups ever in conflict? How does the manager keep these pressures in balance? Under the new liberalized economic policy will the balance of power shift? It was the team's feeling that they were too unknown to the Deputy Plant Manager to be talked to about these matters.

One interesting thought lingers. When the companies responsibilities began and indeed at the production door it seems quite obvious that the inputs of the Staff and Workers Committee would be very helpful to the enterprise. Now in the new environment, when the company must make decisions on product lines and product mixes and quantities, make bets on market opportunities, and put aside money for research and development and capital expenditure can the Staff and Workers Committee have the same control of the plants activities and future as in the past?

Before leaving this summary of the interviews at the Peking Automobile Company this is a useful place to report on the results of a questionnaire given to the participants in the seminar. About 175 useful replies were received. The questionnaire read as follows and the actual response averages for the participants as a whole are given:

(1) In my opening lecture a list was given of the functions of any manager:

1. Setting Objectives: Determining what to work towards.
2. Organizing: Dividing the overall task into organizational jobs.
3. Staffing: Putting right persons into jobs.
4. Directing: Directing personal activities.
5. Motivating: Encouraging persons best efforts.
6. Measuring/Controlling: Checking progress towards objectives.

(2) Now here is an example of ranking these functions in the order of your interest to know more about them. (1 means greatest interest, 6 least interest):

An an example:	Rank
Setting Objectives	2
Organizing	6
Staffing	4
Directing	5
Motivating	1
Measuring/Controlling	3

(3) Now rank these elements from 1 to 6 in order of your interest with 1 meaning most interest and 6 the least:

Function	Rank
Setting Objectives	1.29
Organizing	3.05
Staffing	3.43
Directing	4.60
Motivating	3.96
Measuring/Controlling	4.54

(4) Which of the following management functions are most highly developed in your company. Rank them from 1 to 4 with 1 meaning most highly developed and 4 least highly developed:

Accounting	2.25
Finance	2.25
Marketing	3.84
Production	1.55

Note the greatest interest in Setting Objectives, reflecting the newness of this task since the State is relaxing its central planning direction. Not surprisingly Production is regarded as the most highly developed business function and marketing the least.

Financial Management and Accounting

Lectures and Comments by

Mr. Niall Lothian
Consultant in Financial Management

A. Lecture Coverage

1. General Aspects of Financial Management

Role of the financial manager

Tasks of the financial manager

Distinction between Liquidity and Profitability

Management of financial resources: Cash (major emphasis on cash flow, with diagram)
Inventory control
Amounts receivable

Arranging finance

Capital investment decision (with example of DCF)

Problems in Capital Budgeting

Financial Manager's Score-keeping tasks: internal accounting
role of internal information
external reporting

2. Management of Financial Resources

The Nature of Working Capital: cash
accounts receivable
inventory

Importance of Working Capital Maintenance

Financing total permanent assets and fluctuating current assets

Product Life Cycle: cash profile

Cash: example of cash discount
example of synchronization of cash flows

Accounts receivable: major determinants of level of AR

Inventory Control: 3 types: raw materials, work-in-process, finished goods
Factors influencing level of inventory
How much should we buy at a time?
When should we buy?

Example on Economic Order Quantity: cost of carrying
costs of not carrying enough

3. Cost Accounting and Management Control Systems

Three purposes of an effective accounting system
Distinction between planning and control
Characteristics of cost — variable cost
fixed cost
assumptions
break-even chart (with example)
Full costing versus direct costing
implications for management decisions
Variation in Cost Accounting Patterns
Fixed cost = Committee and discretionary
Variable cost = engineered and discretionary
Why do overheads grow? how can they be reduced?
techniques for reduction - selective
- blanket
Management control systems - fundamental goals (not covered)

4. Budgetary Control and Standard Costing

Importance of planning and budgeting
Definition of budget
Benefits of budgeting - think ahead
- benchmark of performance
- co-ordination
Human problems associated with budgets
Time horizon
Budget exercise - major exercise distributed previous evening
Difficulties of Sales Forecasts
Standards for Control: distinction between standard and budget
ideal standards v. currently attainable ones

Material	Labour
- price	- rate
- efficiency	- efficiency

Reasons behind variances
Trade offs between variances

B. Question and Answer Session : 15 September 1980

Questions submitted:

1. Please illustrate the system of organization for financial management and accounting patterns used in UK and USA by case studies of iron and steel enterprises. For example (a) relationship of financial receipts and payments as well as capital allocation between joint ventures, large companies, subsidiaries and divisions, workshops etc. (b) which accounting patterns are being applied by them and what are their interrelationships ?

2. How do you practise cost accounting in the UK and USA? For instance (a) preproduction cost budgeting (b) cost management in the process of production (c) how are the indices assigned to successively lower organizations? (d) how can you make the staff and workers understand and be concerned with costs?

3. How do you develop the functions of marketing, pricing, capital and other factors and bring them into full play to improve management?

4. What functions and powers do financial managers and chief accountants have? What positions do they take and what role do they play in enterprises?

5. Please give us briefing on the theory for price formation and its mathematical modelling. What items are included in balance sheet for enterprises in UK and USA?

6. How do you make market forecasting and strategic forecasting, for example, how did you calculate and obtain the figure for steel product requirement for year 2000?

7. Please explain again example on capital budgeting. Neither project seems completely satisfactory. When you try to consider economic effects, how are you going to select investment policies?

B. Education and Training in Accounting and Management Control in Light of the Chinese Experience

1. Introduction

Accounting is the language of business. An understanding of its usefulness - and of its limitations - is desirable for all managers in all types of organizations. Discussions and observations in Beijing (admittedly severely restricted to those we were allowed to speak to) lead me to the conclusion that industrial managers in China have virtually no knowledge of the usefulness and limitations of accounting data, and, worse still, industrial accountants have a very limited, almost naïve, grasp of the basic tools of their trade.

In a strictly planned economy such as the Chinese one, this conclusion is in no way surprising. Industrial enterprises are required to meet certain production targets set by, ultimately, the State Economic Commission. If these targets are met, the enterprise is held to have fulfilled its task successfully. The question of optimum utilization and efficiency of the traditional scarce resources of land, skilled labor and capital contribution seldom enter the picture at the plant level. It seems to me that no matter what political complexion surrounds the industrial scene, the paramount goal should be the maximum industrial output for the minimum input. Accounting and properly designed management control systems are tools that can go a long way to assist an enterprise in achieving this goal; in China these tools are roughly fashioned and inadequately applied.

2. Specific Findings

Let me be more specific about the problems and shortcomings which I encountered whilst engaged both in plant visits (detailed in main report) and in conducting seminars with the 270 or so industrial managers in the Ministry of Metallurgy (details of topics covered by me are to

be found in the appendices to this report, I should stress, however, that I was not adopting the prescriptive stance of a management consultant during my visits and discussion; my aim was solely towards making a series of recommendations on the education and training requirements in the accounting and management fields.

My comments apply to both enterprises unless otherwise stated:

Topic	Points
1. Personnel spoken to	-Steel: Directors of Finance and Planning -Car: Director of Finance and Accounting
2. Budgetary Control and Standard Costing	-Costs controlled by unit of steel ton, or car. -Costs include raw material, wages, expenses and depreciation. -Management clearly understand distinction between direct and indirect costs. -Standards set by Co. H.Q. Subsidiary workshops work on production targets only. - Bonuses awarded to workers who achieve target production (no reference made to cost of production) -Investigation of variances almost non-existent
3. Overhead allocation	-Steel: proportion of direct cost (very crude method) -Car: manufacturing hours required per car. -Small problem in total costs: Steel: Overheads 4% labors 6% raw materials 90% Car: Overheads 15% labors 1% raw materials 13% Bought-in parts 71%
4. Pricing	-entirely a matter for the State - in future, self-management policy will enable management discretion. -crucial failure to understand distinction between direct costing and absorption costing. Management can't conceive of selling units

for less than "full cost".

-Car: "dumping" is being practiced in the handful of export units sold. Trade company (State) makes good difference to Car Co.

5. Depreciation

-Government set figure average 3.8% - 4%

-Both companies admit that these are unrealistic; hoping for higher ones soon.

-Companies powerless to adjust figures.

-Many assets 40^{+} years old

6. Inventory Control

-weak area of control, and admitted to be so. too high inventory being carried.

-ordering takes a long time and demands a higher than optimum level of stocks. Also, age of plant leads to many spare parts being carried.

7. Capital Budgeting

-Steel: seem to be aware of relating future benefits with present cash outflow. No question of discount techniques however. No evidence of ranking capital projects in order of attractiveness

-Car: no financial criteria applied to project plans. All major decisions taken by Engineering Institute. Appeared to be completely ignorant about screening projects financially.

-Neither company had a financial plan extending beyond current financial year.

8. Benchmarks of performance

-Return on capital employed almost entirely unknown to them. Difficulty in understanding significance of this.

-All ratio analysis is unfamiliar.

-Car Co. "We don't do it because we're not required to do so."

-Valuation of assets must therefore be restricted to book values - unrealistic and incomplete.

9. Financial reporting

-Steel statements to Ministry once-a-month (Grave translator problems here)

-Car: Statements once-a-month to general manager, directors, planning dept, bank, Stastical Bureau and Ministry.

Management meet every 3 months to discuss statements.

Major emphasis on costs.

10. Accounting education

-both companies run special classes, staffed by skilled accounting personnel, teaching accounting and economic theory and very basic cost accounting.

-No mention of interpretation of accounting or of management control techniques for senior managers.

-Car Co: only 12% of accounting personnel are college trained - causes much worry for Director of Finance.

A concluding note: In neither discussion did I gain the impression that accounting and control data were being generated to assist management. It seemed that the accounting numbers generated were an end in themselves; the personnel I spoke to appeared not to be concerned with using the information to improve decision making. Nor did the companies use the information in any integrated way. There was an overall naivety about the potential for accounting data in management.

3. Requirements for a Common Body of Knowledge

In a planned economy such as China's, both parties to the plan, those who draw up the plan, and those who implement the plan, should speak the same accounting and control language. It is futile to educate one of these parties in isolation. But of course it will be readily appreciated that the depth of technical knowledge and appreciation may differ without the aims of the educational development programme being frustrated. For example, there is little value in the senior planners in the State Economic Commission being familiar with the intricacies of overhead absorption methods and techniques (a matter for the enterprise level), but there is a sound argument for suggesting that they should be aware of the implications for operating profit on management decisions being made on a basis of direct costing or full costing (also of concern to the plant level).

In the following suggestions for establishing a common body of knowledge, the underlying goal of the enterprise is assumed to be the maximization of operating profit within the constraints that society places upon the industrial unit today. That seems to me to be the common goal of an enterprise either in a market or a planned economy. What happens to the profit is a different matter, however, but this should not influence us in deciding the kind of knowledge which should be imparted.

There are three distinct groups requiring an educational development programme in accounting and control.

(a) Enterprise planning officials in the SEC and Ministries The general objective of a development programme for this group of people is to help them develop skills in the understanding and use of accounting information for management decision making. The objective of the programme would not be to prepare them to become accountants or even to prepare accounting information. However, they would be involved to some extent in the preparation side as part of the necessity to learn and fully understand from doing. By gaining an understanding of the assumptions and concepts underlying accounting information and reports they would be better able to understand the advantages and limitations of accounting information, how to use it, what questions to ask and how to more effectively use the accounting and control personnel in the enterprises.

There would be three main sections to the programme:

1. Accounting information for Analysis and Decision Making: The focus in this segment of the course would be to understanding cost - revenue - profit behavior in order to generate relevant accounting information for decision analysis. Those costs and revenues which differ among the alternatives under consideration should be analysed. Accounting skills, concepts and tools used would include: break-even analysis, contribution

analysis, fixed and variable costs, common and separable costs.

2. Basic Financial Accounting - Model, Statements and Analysis: Here the basic accounting model is introduced together with the underlying concepts that give rise to particular accounting procedures, and some interpretation of financial statements. This section would consider the differences between cash flows used heavily in the first segment and financial statement income.

3. Management Control Systems: The focus in this segment of the programme would be on management (not strategic or operational) control. The key areas include system characteristics, organizational structures, budgeting and reporting, evaluation and reward, and transfer pricing.

(b) Enterprise General Managers: There seems to be no reason why managers of the biggest and economically most signific nt enterprises should not enjoy the benefits from a development programme such as the one outlined above. It is this group of people who are answerable, in the first instance, to the SEC and Ministries, and it is imperative that they be made aware of the concepts and skills which the planners are expecting the enterprises to embrace. I envisage a far greater relevance for the enterprise manager in the syllabus outlined above than for them in what I describe below for the accounting staff.

In a strictly hierarchical society such as China's, however, it may be deemed appropriate to impart this knowledge in a different manner and time to the managerial cadre. The next section of my report will discuss methods of implementation.

(c) Enterprise accounting staffs. It will be readily appreciated that a management development programme described above will be wholly without value if the internal accounting and control information is not flowing from the bottom of the organization through to the top. (So called developed economies continue to wrestle with this problem). The quality of financial information reaching the decision maker is directly correlated to the quality of the decisions made. It is therefore essential that enterprise accounting staffs (say, chief accountant and 2 deputies) are exposed to the basic skills and techniques of

management accounting, defined here as the accumulation, classification and interpretation of information that assist individual managers to fulfill orgainzation objectives as revealed by the central planners.

To assist plant accountants in this role, they should undergo instruction in the following topics:

1. Introduction to Cost - Volume Relationships:
   - variable and fixed costs
   - cost - volume - profit analysis
   - profit - volume chart
2. Classifications of cost
   - relationships of income statements and balance sheets
   - product costs and period costs
   - income statement: functional approach and contribution approach
   - job costing
   - process costing
3. Relevant costs and Special Decisions
   - the accountant's role in special decisions
   - the special sales order
   - variable and absorption costing
   - role of costs in pricing
   - contribution to profit per unit of limiting factor
   - the make or buy decision
   - opportunity costs
   - joint product costs
   - irrelevance of past costs
4. Budgeting
   - Characteristics of budgets
   - human relations and time span
   - preparation of a master budget
   - flexible budgets
   - standards for material and labor and overheads
   - controllability and variances
5. Cost Behavior Patterns
   - engineered, discretionary and committed costs
   - determining how costs behave
   - approximating a cost function

Cost Behavior Patterns contd.

responsibility accounting and controllability

behavioral problems with control systems

6. Responsibility accounting and cost allocation

cost allocation

contribution approach to allocation

how to allocate for planning and control

7. Job and process systems and overhead application

control and product costing purposes

job-order costing

problems of overhead application

process costing

8. Overhead application:

direct versus absorption costing

fixed overhead and absorption costs of products

reconciliation of direct costing and absorption costing

9. Capital budgeting

discounted cash flow model

internal rate of return

uncertainty and sensitivity analysis

net present value

conflict of models

4. Methods of Instruction

To a large extent the easy part of the report is completed, that is identifying the very obvious weaknesses in Chinese industrial accounting and control functions, and recommending a common body of knowledge designed to overcome the problems. The difficult part, of course, comes when one asks the question "how are we going to do all of this". I cannot pretend to have any answers, only a few suggestions which might be considered sufficiently useful to investigate in greater depth.

Some initial points should be made:

(a) There are no short cuts in such an extensive programme: this is going to demand costly and intensive effort on UNDP's part to implement adequately.

(b) There seems to be differing time horizons within the three groups identified in the previous sections. It seems imperative for the Enterprise planning officials (and desirable for some Enterprise General Managers) to be "fast-tracked" at the outset. The immediacy for the accounting staffs is not so obvious.

(c) The initial surge of knowledge transfer will have to be supported by a long-term programme until such time that China has developed an educational infrastructure capable of satisfying demand.

A. Enterprise planning officials in the SEC and Ministries

To my mind, this is the most important task in the immediate future, simply because without the understanding and support of this group for the advanced management techniques thought by us to be desirable, the programme for lower grade staff is of little value.

My suggestion would be to expose these planners to a direct-taught management programme tailored for the Chinese experience. This programme should be a mixture of cases, lectures and workshops and should be staffed by effective teachers, not consultants, the teachers having had business school experience. The whole programme may take as little as six weeks, provided the participants were expected to prepare extensively prior to, and during, the seminar. In order to use the teachers' time efficiently, I would suggest that an identical course be run in parallel for managers selected from the economically most significant enterprises. Given the intensity of the teaching involved, and the social conditions to be experienced in Beijing, it may be possible to work out a schedule which would involve a revolving

faculty who could be present for, say, 10 days or two weeks each. The programme would need to be directed and coordinated by an individual who could be present for the duration of the programme. Perhaps the programme could be run twice a year for a short number of years.

I suggest two further methods of instruction for this crucial group which could be used for "follow-up" instruction in future years.

(a) A couple of planning officials be selected for attending a management development programme in the West. In this way the initial on-site programme could be topped up by, say, 4 people returning each year from business school and bringing with them the newest techniques and concepts being practised in the West. It would be important, however, to use the same business school so that the returning "graduates" would be able to "speak the language" and to update earlier graduates.

(b) UNIDO should investigate the aims and methods of the remote learning MBA programme being pioneered by Heriot-Watt University under the direction of Professor Keith Lumsden (formerly of Stamford University). I shall send to Dean Harry L. Hansen and Dr. L.F. Biritz some explanatory information on this programme when I return to Edinburgh, but let me explain briefly what is envisaged. It is recognized that many companies have the need, but neither the time nor the money to spare, for high level management education for their bright young men. Lumsden, supported financially by a UK educational trust and by Hewlett Packard of Palo Alto, California, is in the process of developing a package of modules in the traditional business areas which if taken together, would combine to give the participant an examination-based MBA degree to be awarded by Heriot-Watt University. The educational material is now being prepared by world authorities in their respective fields and is being filmed for distribution by color video cassettes. Substantial printed material will support these cassettes. Subject modules will be marketed individually, or together.

It is my belief that such educational technology could be adopted to give senior planners and enterprise managers a dynamic and high level business management course, without requiring the physical presence of instructors, and which could be undertaken in a flexible manner, module-by-module, subject-by-subject, at the pace most appropriate for the participants. It is highly unlikely, I would think, that many "students" would wish to pursue their studies to the point where they would want to present themselves for examination (and graduation). The video tapes and other teaching material could be used many times over.

B. Enterprise General Manager

In the proceeding section I suggested that perhaps managers of major Chinese enterprises be selected for "fast-track" treatment and be given a taught management development programme as part of the first phase. The remote learning material seems to be very appropriate for the other managers : they could receive the instruction either individually or in groups, and could organize themselves into discussion groups and appoint one of their number to lead on particular topics. The cassettes could also be shown to other managers in the enterprise at the discretion of the general manager.

C. Enterprise accounting staffs

There is no ready answer as to how to educate, sometimes from a very low knowledge base, huge numbers of "accountants" The best solution would be to amend (to suit the Chinese experience) any one of a large variety of basic level correspondence courses in cost accounting and management control. The effectiveness of this material on the participants may be tested by regular computerized quizzes. Eventually, perhaps, professional style examinations and qualifications may emerge. The main professional accountancy bodies in either the UK or USA would be able to advise on which commercial colleges' material would be worth considering for adoption.

Summary of methods of instruction

A. Enterprise Planning Officials at SEC and Ministries	Taught Development Programme	a. Business school for few b. Remote learning MBA material
B. Enterprise General Managers	Taught Development Programme for selected managers (at same time as above)	Remote learning MBA material
C. Enterprise Accounting Staffs		Correspondence course in basic management accounting

Production Management

Lectures and Comments by

Mr. Rolph R. Berg
Consultant in Production Management

A. Lecture Coverage

1. Introduction

- The tasks of P.M.
- The meaning of PRODUCTIVITY and EFFICIENCY
- The staff functions of the P.M. organization:

  PROCUREMENT
  ENGINEERING
  PRODUCTION PLANNING AND CONTROL
  PERSONNEL

- The need for PLANNING
- The benefits of PLANNING
- VALUE ENGINEERING and VALUE ANALYSIS

2. Materials Management

- The procurement functions:

  PURCHASING
  THE CONTROL OF SUPPLY ITEMS
  INVENTORY CONTROL
  RECEIVING
  TRAFFIC
  SHIPPING

- Product SPECIFICATIONS
- The ECONOMIC inventory levels
- How to FORECAST? P and Q ANALYSIS
- The method of the ROLLING FORECASTING
- The PRODUCT STRUCTURE
- The DEMAND- and SUPPLY CONTROL

- RECEIVING and INSPECTION
- ISSUING from STOREROOM
- NEED for PHYSICAL COUNT
- OPTIMIZATION

3. Materials Handling

- The Materials Handling CONCEPT
- The INFORMATION and CONTROL SYSTEM
- The steps of ANALYSING the Materials Handling problems
- The major phases: MATERIAL, MOVE, METHOD
- FACTORS of Materials Handling
- MATERIAL FLOW and LAYOUT (4 examples)
- The new technology INFLUENCE on Materials Handling
- The 10 RULES to observe
- REQUIREMENTS for STORE-KEEPING
- CENTRALIZED or DECENTRALIZED storerooms?
- SAFETY
- TRAINING in Materials Handling

4. Production Planning and Control

- CONTENTS of Production Planning and Production Control
- The MANPOWER BUDGET
- The FACILITIES BUDGET
- The MATERIAL BUDGET
- The ECONOMICAL FACTORS:

  QUALITY and RELIABILITY
  STANDARDIZATION and SIMPLIFICATION
  The ECONOMICAL MANUFACTURING QUANTITY
  CAPACITY and LOADING

- The ANALYSIS of FLOW PROCESS
- MEANS for setting the system in motion:

  The PRODUCTION ORDER
  ROUTE SHEETS
  The JOB TICKET

- SCHEDULING: FINITE and INFINITE LOADING
- ANALYSIS of OVERLOAD and UNDERLOAD
- USE of COMPUTERS in loading and scheduling
- DISPATCHING:

  Principal FUNCTIONS
  FOREMAN-DISPATCHER relationship
  Machine ASSIGNMENTS
  REQUISITIONING and ISSUING Material
  PROGRESS REPORTS and FOLLOW-UP
  LOSS CONTROL

- The ROLE of PRODUCTION MANAGEMENT regarding Production Planning and Control
- The IMPORTANCE of INFORMATION and DECISION MAKING
- The ELEMENTS of MANAGING

5. Answering the Following Questions

1) What are the criterion of good Production Management or poor Production Management in the Western countries?

2) How to determine the volume of sales and production following the different conditions of the market? (in the Western countries). How to make decision when the volume of sales is not equal to the volume of production?

3) Please cite 1 example (including data) to show how a Western factory determines monthly production volume and how to reach this monthly production plan?

4) Cite one example stating the application of automatic production management (in Western countries).

5) The content and the application of MPM (= Metro Potential Method).

6) In production management how to apply:

A Industrial Engineering

B Systems Engineering

C Operation Research

D Linear programming

B. General Observations and Comments

The present situation in China shows a shortcoming in industrial development. One of the reasons for the arrears is a lack of management expertise, and therefore the goals must be to upgrade industrial management capabilities as quickly as possible.

Such an undertaking needs a re-education of practising managers because until today, they had only been responsible to follow instructions and orders. If they want to apply the management methods used in industrialized countries, they will have to learn to make decisions by themselves, being fully responsible for the results. There appears to be a strong contrast between Western management practices and the approach in China, which is more a contrast in mentality and of personal motivation. Perhaps this was the reason that it was difficult to get answers and to learn from the experiences of the seminar participants.

The lecturer also had to consider the Chinese way of thinking, regarding new aspects of production management. Only few participants were able to evaluate all factors which are important for decision-making. Preference was shown to copy and learn new methods and experiences instead of thinking independently. But experience cannot be learned as it is by definition based on actual doing.

The conclusion is that one should not only teach management science and techniques, but that Chinese managers will have to be exposed to management philosophies at the same time, which should be complementary during management seminars.

Another aspect of management development is the motivation to become a manager. With increasing liberalism in China, workers already get a premium for special efforts. The premium for Chinese industrial managers could be training in or study tours and visits to industrialized countries, in addition to financial rewards.

The knowledge of a foreign language would be very useful for Chinese managers so that they are able to follow foreign management literature, although many technical publications are available in Chinese. Presumably, management publications will find their way to China in the near future as well.

Teaching management subjects in China with the help of interpreters is difficult. A teacher must have direct contact with the students as some problems can only be explained in discussions, if possible, in small groups.

A restriction of the number of participants in future seminars is recommended and a careful selection based on qualifications is necessary. Perhaps for China it would be of greater advantage to have a limited number of highly qualified managers instead of a great number of superficially trained manager cadres.

To know a foreign language, to have received training in industrialized countries, to have spent time in a company there and to belong to the "elite" of China's new managers, all this could be a strong motivation to become a manager in China, to take up the responsibility of running important companies. Well trained managers must be able to utilize computers in their operations.

A weak point of computer technique is the relation in hardware to software and the dependency of hardware suppliers to software development. Therefore, the Swiss Government has established at the beginning of 1980 a "Swiss Software School" for all persons, especially for those from the developing countries, who want to learn software programming in different machine languages and for different but practical purpcses. Perhaps there would be a chance also for Chinese fellowships.

C. Seminar Observations

Fortunately, the four experts selected by UNIDO, understood each other very well, so that day-to-day co-ordination was easy. Such co-operation is absolutely essential, otherwise the preparation of a seminar will take more time.

The level of expert lecturers and of the participants must match. In this seminar, the make-up of participants was perhaps too heterogeneous.

For the next such seminar, it is recommended that it is clarified in advance whether the goal of the seminar is teaching or gathering of information, as implementation will be quite different. Teaching demands lectures, exercises, case studies and discussions, while information gathering requires visits to factories. To combine both, more time is needed.

The success of the lectures depends to a large extent on the quality of translation, as some subjects need special knowledge of the interpreter. It might be an advantage if the interpreter has training in the particular management speciality and the lecture subject. Ideally, the translator should be a counterpart to the expert.

D. Visit to the Beijing No. 1 Machine Tool Plant

The plant was visited on 11 September 1980. It was established 1956/1958 and has a personnel of 7500 today, of which 5500 are in production, working in fourteen different shops. The output is 4000 milling machines per year (from 2 to 600 tons). All engineers of the company have completed their studies at the company school.

The most important problem for production management is the lack of any sales forecast and consequently the uncertainty of the production programme. Until recently, all manufacturing orders came through the Machine Bureau, respectively through the Government.

Several different types of milling machines were in production in the shops, some of which in series of 10 to 50 machines. Also observed were a few very heavy special purpose machines and a series of about 100 small mills, probably for the food industry.

The factory uses its own machine tools, and the entire production of the factory consists of single-purpose machines. The company has developed internally a few special machine tools for manufacturing the bodies of milling machines.

The present equipment of the shops visited does not allow successful competition with Western machine tool plants, and the need for great investments to improve present manufacturing capabilities was confirmed.

The production planning and control system is very simple, but it was sufficient till now because the company had always the same series to manufacture. Any diversification, based on actual market proportions, will demand a better system.

The performance of the workers is verified weekly. If a worker supersedes his normal working time of 48 hours per week, he gets a premium. The best workers reach 65 to 82.4 hours per week or 35 to 72% more than 48 hours. The weekly calculation of the performance of all workers is written on a blackboard in the shop and serves as motivation.

The impression after visiting the company is that, until today, it had no marketing and sales problems, and consequently only a few production management problems, in view of fixed production targets. But, the company is not prepared to compete under the new economic condition. A joint venture with a modern and successful foreign machine tool plant might be a good approach for improving operation and productivity.

Generally speaking, production management problems in China are directly the result of the new economic environment. The satisfying of actual market needs combined with productivity and financial performance requirements imposes much greater demands on production managers than was the case during the more static, centrally directed economic era. These demands on the managers are further amplified if the particular factory is to compete in international markets. If the future industrial managers of China are to operate successfully in such an environment, improving management capacities at all levels, and particularly in the field of production management, will be imperative.

Utilization of Computers for Industrial Management

Lectures and Comments by

Mr. Kan Chen

Consultant in Computer Utilization for Industrial Management

A. Lecture Coverage

1. Introduction

Scope of presentation

Relevance to the whole mission

2. Organization of Digital Computers

Hardware

- Memory, arithmetic, and control
- Input-output, and communications

Software

- Programming
- Machine, assembly, and procedure-oriented languages
- Compilers and diagnostic routine
- Applications software

Orgware

- Organization for computer utilization
- Impacts and interfaces between individuals and organizational units

3. Computer Applications

Scientific and business applications

Manufacturing industry applications

- Computer-aided design
- Computer-aided manufacturing
  - Computer monitoring
  - Direct digital control
  - Supervisory computer control
- Computer support for manufacturing
  - at the operations level
  - at the plant level
  - at the headquarters level

4. Historical and Future Trends in Computers

Super, mini, and microcomputers
Trends in computer characteristics
Trends in computer-aided manufacturing

5. Computers in Developed Countries

Stages of computer utilization growth
Some available computer systems for production control
IBM's COPICS (Communications Oriented Production Information and Control System)
Burrough's PCS II and III (production Control System)
DEC's MDC (Manufacturing, Distribution, and Control)
Some available microcomputers

6. Computers in Developing Countries

Do developing countries really need computers?
Special problems of computer utilizations in developing countries
Requirements for successful applications
Computer education and information services

7. Factors Affecting Decisions on whether Computers should be used

Development goals and policies
Economic and non-economic considerations
System analysis, engineering, and management

8. Computer Selection

Objectives and requirements
Specifications
Costs and budget
Application benchmarks
Expansion potential
Vendor's support
Purchase or lease
Consultant's assistance

B. ACTIVITIES

The author has given four lectures to over 200 participants assembled by the State Economic Commission. The contents of the lectures are outlined above. About 100 transparencies used in the lecture have been translated into Chinese and distributed to all the participants for them to keep. In addition, in response to the request by the participants, additional materials have been included in the lectures on systems engineering and decision analysis. The author has also contributed to the other experts' seminars through impromptu discussions and comments.

The author has visited the following four factories and interviewed the managerial and technical people responsible for computer utilization for industrial management:

1. Capital Steel Plant (Beijing)

   Acting Chief Engineer: Gao Bo-cung

   Chief of Computer Station: Tan Zhu-cheng

2. Beijing Automobile Manufacturing Plant

   Deputy Plant Manager: Liu Yiao-ming

   Chief of Computing Centre: Li Zhao-ming

3. Beijing International Economic Co-operation Information Processing and Training Centre

   Deputy Director: Mo Gun-sheng

   Systems Engineer: i Zhu-feng

4. Hangchow Turbine Plant (Hangchow)

   Chief Engineer: Zhao Shu-xin

   Chief of Computer Station: Tang De-zhung

In order to find out and assess other international management training plans and activities in China, the author has made arrangements for a number of meetings with people involved in these activities, including:

1. Dr. Richard Lee, U.S. Department of Commerce, who is responsible for the U.S. - China Programme for Industrial Management Training at the Dalian Institute of Technology.

2. Mr. Shue Bao-ding, Deputy Director of Industrial Economic Research Institute, Chinese Academy of Social Sciences, who is going to head up a new International Economic Management Graduate School in Beijing.

A questionnaire was prepared and distributed to the over 200 participants who attended the author's lectures on computer utilization for industrial management. A total of 118 questionnaires were returned. The following statistics should be of interest:

a. Have you used computers? 22 yes 94 no.
b. Is there a computer in your plant? 33 yes 77 no.
c. In the next 5 years, should your plant use computers for industrial management? 82 yes 10 no 8 do not know.
d. If a computer is used, where should it be put?
   8 - in a computing centre
   30 - in a production department
   5 - other places (such as plant manager's office)

C. COMMENTS AND OBSERVATIONS

The industrial use of computers in China has taken a different route than that in Western countries. Instead of using computers first at the business end (accounting, etc.) and then moving toward production planning and process control, which was the path taken in the West, the Chinese began using computers for automatic control of production processes, and it was only in the recent past when they began using computers for wage calculations, simple inventory management, critical path analysis of production process, etc. This historical trend has made it difficult

for Chinese managers to fully appreciate and support computer utilization for industrial management. The general impression in the Chinese manager's mind is that computers are technical tools for production.

What has made things worse is the fact that many of the process control computers are home-made and were installed during the Cultural Revolution. The hardware of these systems are unreliable and need frequent maintenance. The software, in general, has never been fully developed and tested. Thus, most of these systems are still considered experimental "toys" for research purposes and are not counted upon by the Chinese manager to aid production on a regular basis. Moreover, the Chinese-made computers are expensive, often ten times as expensive (in local currency) as their equivalent Western systems, which unfortunately must be bought with foreign exchange.

At present, three of the Chinese factories which are most advanced in their planning and implementation of computers for production management are: (1) the Shenyang Blower Plant and Shenyang Machine Tool Plant, which are close to each other and share an American system that is being expanded (IBM 4331) and split into two separate ones; (2) the Beijing Automobile Manufacturing Plant, which has an East German EC 1040 system, and (3) the Hangchow Turbine Plant, which has a West German system (Siemens 7738). The author visited the last two installations. Although the current utilization factor is still quite low, the author was favourably impressed by the innovative approach taken by the responsible people in their development of application software to meet the specific needs of their factories on a preliminary basis. These include the projection of delivery dates, live loadings, and plant capacity calculations. However, for more effective use of the facilities for management purposes, they will need to develop an effective and efficient data base management system, for which they can well use some consulting services from outside China.

The Beijing International Economic Co-operation Information Processing and Training Centre is getting a Burroughs B6810 computer system. Under the current agreement involving UNDP, China, and U.S. Department of Commerce, the system is restricted to commercial and institutional management applications (banks, hospitals, etc.), and not to scientific and insutrial design calculations. Whether industrial management applications are permissible is a moot point.

D. RECOMMENDATIONS

Computer is not a panacea for management problems. The presence of a computer in an enterprise should not be equated to the modernization of the enterprise. On the other hand, properly used computers can provide systematic and timely information needed for management decisions. And informed decisions are essential for increase of productivity and competitiveness in a dynamic business environment. Thus, computer utilization for industrial management is an inherently important element for China in her new era of economic rationality.

The abundance of manpower in China makes the use of computers for the sake of production automation less important than the use of computers for timely management information and for the economic rationality of management. The latter point is of unique importance to China in view of the fundamental policy changes since 1976. Since computers work on the basis of logic, the very consideration of, and serious preparation for computer utilization for industrial management - even before or without computer implementation - can greatly improve economic rationality of management. Thus, the concept as well as the deployment of computerized management information system should be useful to Chinese managers.

The actual use of computers for industrial management must have the appreciation of support of the top management. The training of top management in this area should emphasize the following points:

(1) What computers can and cannot do for managers.
(2) The need for a combination of hardware, software, and orgware (reorganization of company activities) to make full utilization of computers.
(3) The difference between system software and application software.
(4) The relative advantages and disadvantages of purchasing versus developing own software, between obtaining them domestically versus importing from foreign sources.
(5) The role of management in deciding whether computers should be used and in selecting appropriate computers.
(6) The appropriate ratio between hardware and software personnel.

The training of technical people for computer utilization for industrial management should emphasize the following points:

(1) An overview of industrial management.
(2) The need and skill for working with managers in various functional areas to achieve computer utilization.
(3) The need for focusing more on data management than on computer management.
(4) The know-how of data base development and management.
(5) The knowledge of available software packages for industrial management.
(6) The knowledge of writing technical specifications and conducting verifications in the process of computer selection.

The training of both managers and technical people should not be conducted only in the classroom. The trainees must see computers in action for industrial management. In an ascending order of desirability (and cost), there are several alternatives:

(1) Computer demonstration in China, using reliable hardware and application software, the latter based on textbook problems or typical cases from the real world.

(2) Sending Chinese managers and technical personnel abroad on inspection tours and/or advanced studies, including interviews with foreign managers and experts.

(3) Making one or more management information systems work in Chinese factories and using them as teaching factories.

The primitive status of computer utilization for industrial management, and the sheer magnitude of the management training problem in China, suggest the need for institution building. The author would recommend the establishment of a "Training and Consultancy Centre for Computer Utilization for Industrial Management". Initially, this could be a modest centre using mini-computers that can be expanded later, and using software that is upwardly compatible with larger computers. With such facilities, the Centre could perform a number of functions in the immediate future, including:

(1) Demonstration of computer utilization for industrial management, with or without connections with a larger training programme for industrial management.

(2) Information clearing house for available hardware and software in foreign countries, in both computer manufacturing and computer using companies or enterprises.

(3) Organization of inspection tours to foreign countries in the field of computer utilization for industrial management.

(4) Collection and sharing of information about computer utilization in China for industrial management.

(5) Preparation and dissemination of training materials, including films and video tapes in the relevant field.

(6) Provision of training and consulting services to Chinese factories interested in computer utilization for industrial management.

In the long term future, the Centre may expand its facilities and services as follows:

(1) Expand and upgrade computer hardware and software to main frame sizes.

(2) Work along with foreign experienced consulting firms to design, install, adapt, and improve complete management information systems for a few "teaching factories" in China.

(3) Develop both system software and application software modules, particularly suited to Chinese industrial management needs.

(4) Provide consulting services to Chinese enterprises, including the application of systems engineering to determine where and whether computers should be used for industrial management.

(5) Provide consulting services to Chinese enterprises in their selection of computer hardware and software to purchase or to develop their own.

(6) Provide consulting services to Chinese computer manufacturers in the area of product development and users' evaluation/ suggestion.

Finally, the author wishes to express his opinion about foreign experts to be sent to China. Too often the Chinese are too modest, and the experts are too presumptious. The invitation of written questions and the use of questionnaires have helped the accomplishment of two-way

communications during this UNIDO mission. This practice should be continued in the future. In addition, the following approaches may be tried:

(1) Send the same experts back to China from time to time for future missions.

(2) Ask the Chinese hosts to give 2 to 3 day lectures about the history of industrial management changes in China and the critical management problems in China.

(3) Disseminate to the foreign experts (before they prepare their lecture materials in their homelands) written management training materials used recently in China - such material may be in Chinese.

(4) Keep selected experts in China for longer periods.

On the last point, it would be difficult to attract experts, especially those with families, who want to maintain close contacts with the Western world. A possible solution to this problem would be to locate some of the training institutions in a special zone near the Hong Kong border. In such an arrangement, the foreign experts, if they or their families wish, may reside in Hong Kong and commute daily or weekly to the training institutions near the border. It would also facilitate equipment demonstration and maintenance, and certain software development and testing which need to be done in Hong Kong.

Industrial Management-Related Publications in China

1. Research of Financial Problem
2. Finance and Accounting
3. Quality Control
4. Economics Management
5. Technical Economy and Management Modernization
6. Problems of Chinese Economics
7. Finance
8. Labour Work
9. Business Management - Quarterly
10. National Economic Plan and Management - Monthly
11. Industry Economy (two volumes for each month)
12. Industrial Business Management (two volumes for each month)

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