

AN INCENTIVE PLAN FOR
MIDDLE MANAGEMENT

by

WILLIAM ASBURY PORTER

B.A., Adams State College
(1951)

M.S., Kansas State College
(1952)

SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE
DEGREE OF MASTER OF
SCIENCE

at the

MASSACHUSETTS INSTITUTE OF
TECHNOLOGY

June, 1967

Signature of Author..

Alfred P. Sloan School of Management, May 19, 1967

Certified by.....

.....
Thesis Supervisor

Accepted by.....

.....
Chairman, Departmental Committee on Graduate Students

Abstract of Thesis

AN INCENTIVE PLAN

for

MIDDLE MANAGEMENT

by

William A. Porter

Submitted to the Alfred P. Sloan School of Management on May 19, 1967 in partial fulfillment of the requirements for the degree of Master of Science.

The thesis develops an incentive plan for middle management to induce cooperation in job execution. The plan is based upon present day understanding of man's characteristics and the economics of the firm. To insure practicality, the plan is developed within the framework of a medium sized job shop manufacturer. While not designed for the continuous line manufacturer the methodology may be of benefit in solving similar middle management conflict problems.

A judgmental evaluation demonstrates that the plan is useful in decreasing inefficiency due to internal conflict, although it is probably a non optimum solution to the problem. It also supports and embellishes man's motivations and his needs for fulfillment. In addition, three further benefits are derived; increased customer satisfaction, decreased investment and increased time availability for top management. All perceived problems appear to be soluble. The plan cannot be quantitatively evaluated until it is implemented in a company.

THESIS ADVISER

Zenon Soteriou Zennetos, Ph. D.
Associate Professor of Management
Alfred P. Sloan School of Management

Professor Edward N. Hartley
Secretary of the Faculty
Massachusetts Institute of Technology
Cambridge, Massachusetts 02139

Dear Professor Hartley:

In accordance with the requirements for graduation, I herewith submit a thesis entitled "An Incentive Plan for Middle Management."

The writer wishes to acknowledge the help, inspiration and encouragement of those who participated in the evolution of this thesis. Professor Zenon Zannetos, the thesis advisor, was particularly helpful in crystalizing the problem--the dichotomy of needs of the man and the organization. Professor Mason Haire contributed much to the author's understanding of man's basic characteristics and in defining managerial styles. In addition, Professor Douglas Bunker of Harvard University assisted by engaging with the writer in several informal thought provoking discussions. The writer is also indebted to several people employed by the model company whose contributions insure a degree of practicality.

Sincerely,

William A. Porter

TABLE OF CONTENTS

CHAPTER	PAGE
I. INTRODUCTION	1
II. PROBLEM DEFINITION AND MODEL COMPANY	5
Introduction	5
The Environment	5
The Products	7
The Organization	9
Program Integration	18
Operational Control	20
Problem Manifestation	21
The Problem	22
III. ECONOMICS OF ORGANIZATION	26
Introduction	26
Reorganization	26
Change of Leadership	29
Change of Resource Allocation	30
Information and Control	31
Conclusion	34
IV. ORGANIZATIONAL BEHAVIOR	36
Introduction	36
Man's Behavior	37
Man's Innate Motivations	39
Cognition and Expectancy	43
Reward Structure	47

CHAPTER	PAGE
Groups	50
Job Satisfaction	52
V. THE INCENTIVE PLAN	57
Introduction	57
Individual Incentive Formula	57
Profit Leverage and Total Incentive Cost	62
Examples	63
Implementation and Administration	64
VI. CRITERIA TEST AND POTENTIAL PROBLEMS	68
Introduction	68
Basic Criteria	68
Additional Advantages	70
Economics of Organization	71
Organizational Behavior	72
Potential Problems	74
VII. CONCLUSION	77
BIBLIOGRAPHY	79

LIST OF FIGURES

FIGURE	PAGE
I. EXECUTIVE LEVEL ORGANIZATION	11
II. MANUFACTURING ORGANIZATION	13
III. ENGINEERING ORGANIZATION	15
IV. A TYPICAL PRODUCT LINE ENGINEERING GROUP	17

CHAPTER I

INTRODUCTION

A prime responsibility of management is providing efficient coordination of the firm's resources to implement operational plans and achieve end objectives. The principal resources to be coordinated by management are groups of people. Assuming that people will respond to stimulus in their own perceived best interest, one must conclude that management's task is to provide proper stimulus to coordinate the activities of the people in the organization for optimum results. Without coordination each man would behave independently and gross inefficiency would result. Likewise, if improper stimuli are utilized by management a less than optimum result will occur.

The quest of this thesis is to search out and identify a better reward structure for use by top management in providing more efficient control of the activities of the firm. In particular, attention is focused upon the need for better coordinative control of middle management to solve a long standing problem in the batch manufacturing plant or job shop. The problem is one of internal middle management peer conflict which stems from the middle managers perceived vertical rewards of promotion status, increased pay, et cetera versus the lack of adequate rewards to provide lateral support and

integration for efficient job flow. These managers tend to be highly responsive to their superiors and their own groups self-interests often at the expense of the job to be done cooperatively with other groups in the organization. The incentive plan developed herein redirects attention from self-interests to job execution.

The word control is not used in this thesis to imply the control of people, it is used to imply timely coordinative control of group activities. The incentive plan developed in the text to provide stimulus is based upon today's best understanding of man's self interests and motivations and provides a framework which, in fact, facilitates the development and the fulfillment of the individual. In addition to the human side, fundamental economic and technological factors are blended in the development of the plan since these factors are determinants of the effectiveness of the firm.

The idea of using monetary incentives to achieve control has been discouraged by several leading social scientists. This is particularly true in light of several studies which clearly illustrate detrimental effects. However, incentives are used with top management in most large corporations with excellent success. Monetary incentive provides a strong stimulus since it is a highly quantitative reward and leaves little ambiguity as to

desired result. The difference in success or failure of incentive plans is in the proper or improper application as in the use of any tool. As will be seen in the text, monetary incentives used as an indicator to provide group focal point stimulus to enhance a learned response can result in controlled behavior for the betterment of the firm and, at the same time can be used to reinforce a man's self image to his own satisfaction.

Though the devised incentive plan is based on the current theories of man's nature and the economies of organization it is developed within the framework of an existing company to insure practicality. The company used as a model is a medium sized electronics equipment supplier. It is involved in a high technological content, rapidly changing business and its efforts range from small short term studies to large contracts for the delivery of hundreds of units of complex equipment over long time periods. Its organization and business is typical of most job shop manufacturers ranging from the giant aircraft manufacturers to the smallest entrepreneurial shops. Consequently the incentive system may be applicable to many companies. Whether the system has merit for continuous manufacturers in which continuous production is scheduled and physically goes through processing and assembly as an unbroken flow, is beyond the scope of this effort, however,

continuous line organizations exhibit many organizational similarities and the methodology contained herein may provide a heuristic for the development of a similar plan to solve lateral conflict problems.

The material that follows is organized into six chapters. The first is an exposition of the company being used as a model, its environment, its products, its present organization and operation and a discussion of the managerial problem this thesis is attempting to solve. The next chapter examines the fundamental economic factors of organization to determine what action is available to decrease middle management conflict. In the following chapter, man's basic nature as currently understood by psychologists, group behaviorists and social scientists is discussed with the end objective of determining those positive factors which may be used in devising a successful incentive plan.

With these three determinants; a model company, economic considerations, and man's nature as a backdrop, Chapter V develops the incentive plan and its implementation. The following chapter tests the plan with respect to the established fundamentals and discusses some additional advantages and possible problems. The final chapter is a conclusion which draws together all facets for a judgmental evaluation of the plan.

CHAPTER II
PROBLEM DEFINITION AND
MODEL COMPANY

Introduction

In order to insure the development of a practical incentive plan for managerial control a typical medium sized electronics manufacturer is being used as a model. If a successful plan can be devised for this company the plan can most probably be adapted for beneficial use in other organizations. The aim of this chapter is to lay the framework of the model company by discussing its business environment, products, operation, organization and finally to clearly define the middle management problem we are attempting to solve.

The Environment

The customer and the competition are the most influencing external factors on the company. Most of the company's products are produced under contract to the Government on a batch basis. The customer is monopolistic and wields considerably more influence over the company than companies with a plurality of customers. As a result the customer is in a position to make unilateral decisions regarding operations particularly in the areas of accounting, scheduling, project review and guarantee of product

quality. The most relevant result of these controls is the lack of latitude in these areas for management innovation to adapt to changing conditions. In accounting all contracts and all rates are subject to the Government's Armed Services Procurement Regulations (1)*. The Government maintains a full time resident auditor at the plant to guarantee compliance to these regulations. In the areas of project status, contract schedule and product quality somewhat more latitude exists since these items are usually mutually agreed upon at contract initiation; however, even here, management's latitude is limited due to competitive pressure. If the company doesn't accept requested delivery and specified product standards it generally won't be awarded the initial contract. In many ways these manifold constraints make this study simpler since they are not system variables and cannot be altered at management discretion.

About five to ten per cent of the company's sales are not to the Government but are made to the commercial market; however, due to the small fraction, this business is handled within the same framework as the Government work. While the Government is the ultimate customer of the remaining ninety to ninety five per cent of sales only

*All numbers in paranthesis refer to the bibliography at the end of the thesis.

about thirty per cent is sold directly to the Government, the remainder is sold on a subcontract basis to the prime equipment manufacturers but the same external controls apply.

Generally, all contracts are received as the result of open competitive bidding. Bid requests are received, technical proposals and cost estimates are generated, the customer evaluates the bids and selects the best supplier. On major procurements there are usually several iterative cycles to fully define the effort and this often results in a period up to two years before a final contract is awarded. In today's environment most contracts are awarded on a fixed price or equivalently high incentive basis.

There are other environmental problems which affect the company including the stockholders, labor supply, unions, community relations, business laws and financial constraints; however, for purposes of this study the influence of these factors are of secondary importance.

The Products

The total spectrum of electronic products ranges from components such as transistors and capacitors to large scale systems such as complex computer/radar installations. The company of interest produces equipment in the median of these two extremes. In terms of number of components the equipment supplied will contain from a

few hundred up to ten thousand separate parts. The ultimate use of the products are for airborne and space vehicle communication, sensing and control. Some ground based equipment is also produced. The defined product lines of the company are electronic countermeasure equipment, electro optic equipment, aerospace antennas, and automatic test equipment.

A significant characteristic of these types of products, and one which is particularly relevant to this study, is the high proportion technological innovation necessary to maintain competitive position. Contracts for engineering research and development efforts comprise a large portion of total sales. This results in a greater number of lower level groups contributing to the contract effort. The rapid change can best be measured by product turnover which is nearly complete every three years and product lines turn over perhaps every ten years. The company must be highly adaptive and viable to maintain the pace.

Still another measure of importance is the range of magnitude of the various efforts. Some small studies and equipment modifications are completed in a few months for a few thousand dollars. Other jobs require two to four years and hundreds of equipments may be supplied at a multi-million dollar price. At any point in time there will be

from 120 to 200 active contracts in house, no two of which will be alike and any one of which will appear to have an almost arbitrary mix of equipment size, complexity, quantity and delivery schedule.

The Organization

Due to the randomness of the job size and duration and the variable level of sophistication of the products, the organization of the company is based upon functional discipline areas rather than project or contract centers. The "discipline area" is the only continuing commonality factor around which an efficient organization may be based--the jobs are too temporal. This is the prime distinguishing feature of a job shop or batch manufacturer compared with continuous processors with assembly lines and product centered organization.

To develop and produce the products the company has established a multitude of discipline or speciality areas. In engineering about ten prime technological areas are represented such as microwave, electronic circuit, mechanical, servo, optical and countermeasure design. These in turn are supported by other specialty engineering areas including reliability, heat transfer, environmental test, industrial design and drafting. In manufacturing a similar spread of discipline centered or

capital equipment centered shops exist to produce the products. These include production control, methods, industrial engineering, sheet metal fabrication, machine shop, plastics shop, wiring shop, assembly and quality control.

The formal organization of the executive level of the company is shown in Figure I*. The President maintains immediate guidance and integration of the company's Marketing, Product Research, and Planning Operations and he also directly supervises the Finance and Accounting operation. Contractual programs are assigned to the Executive Vice President. Reporting directly to him are the "mainline" functional operations of Engineering, Manufacturing, Program Management and at the present time, a specific integrated program which has adequate continuity and size to warrant separate organization. About ninety per cent of the company's employees, and nearly all contracted efforts, report through the Executive Vice President. About forty five per cent of his people are in Manufacturing, thirty five per cent in Engineering, fifteen per cent in the "ABC" Program, and five per cent in Program Management.

*The writer has taken some liberty in duplicating the company's organization charts by disregarding peripheral consultants and assistants for clarity. Some titles have also been altered and in some instances second order relationships and effects are passed over in the accompanying text for the same purpose.

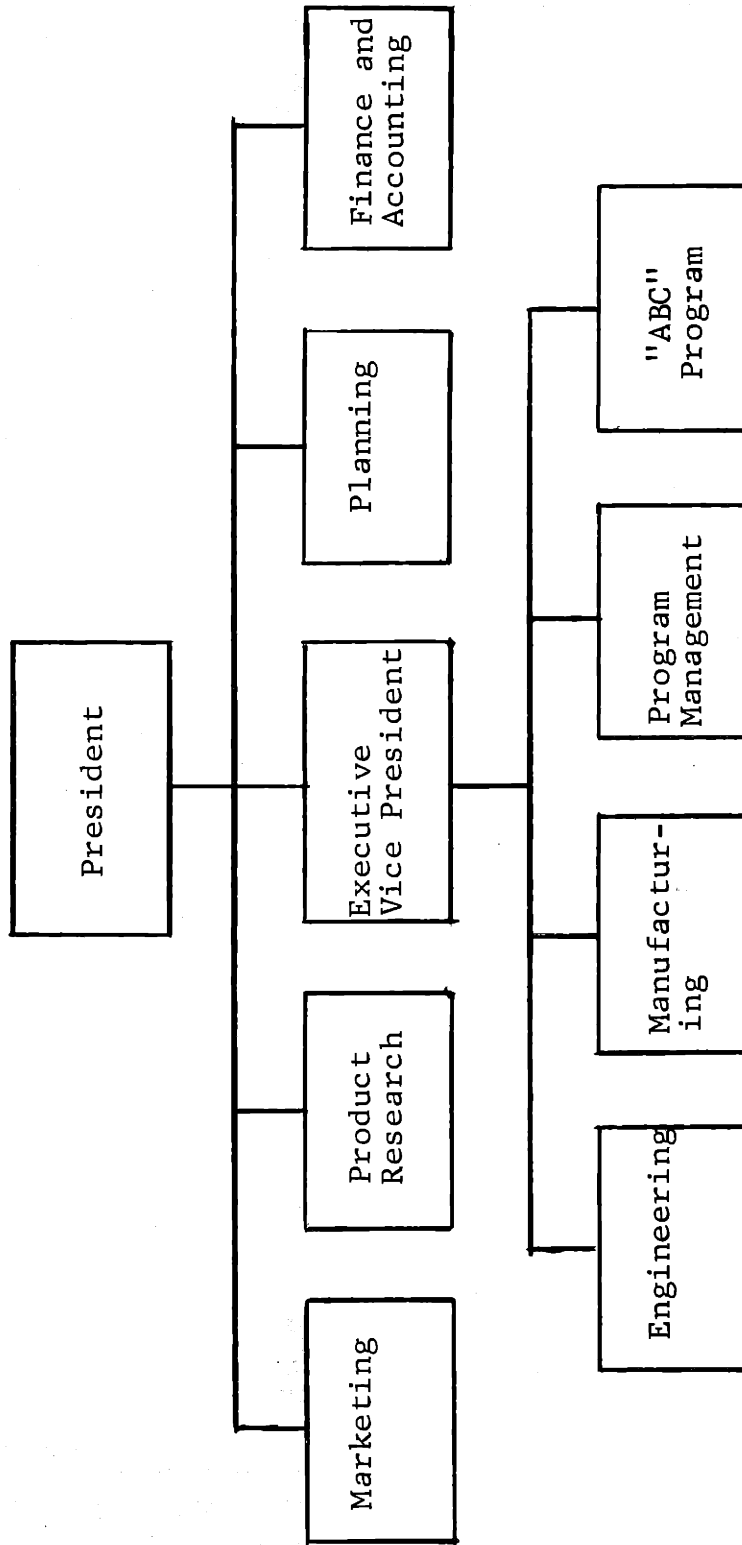


FIGURE I EXECUTIVE LEVEL ORGANIZATION

Manufacturing is variously organized on a technical specialties or on a capital equipment basis as shown in Figure II. Industrial Engineering is responsible for all fabrication methods, standards and job estimating for the plant. Production Control is responsible for the total work flow through Manufacturing. Starting with job schedules they schedule all operations, personnel and material inventories. This group is also responsible for maintaining quality control per job contract. The various Production Shops are responsible for the fabrication and assembly of the products as scheduled by Production Control. Manufacturing Services provides the functional services indicated for the entire company as well as for Manufacturing. Each of the lower level functional blocks shown on the organization chart has from one to three levels of expanding management structure reporting to it. These lower levels are similarly organized on a specialty cluster basis; for example, the Assembly Department is further subdivided into three areas; Automatic Test Equipment (product line), Military-space (work type), Mechanical Assembly (capital equipment orientation) and each of these in turn are divided into Foremen work groups and day and swing shift operations.

Engineering, the second "Mainline" operation, is depicted in Figure III. Reading from left to right, the first four organizational blocks represent the engineering

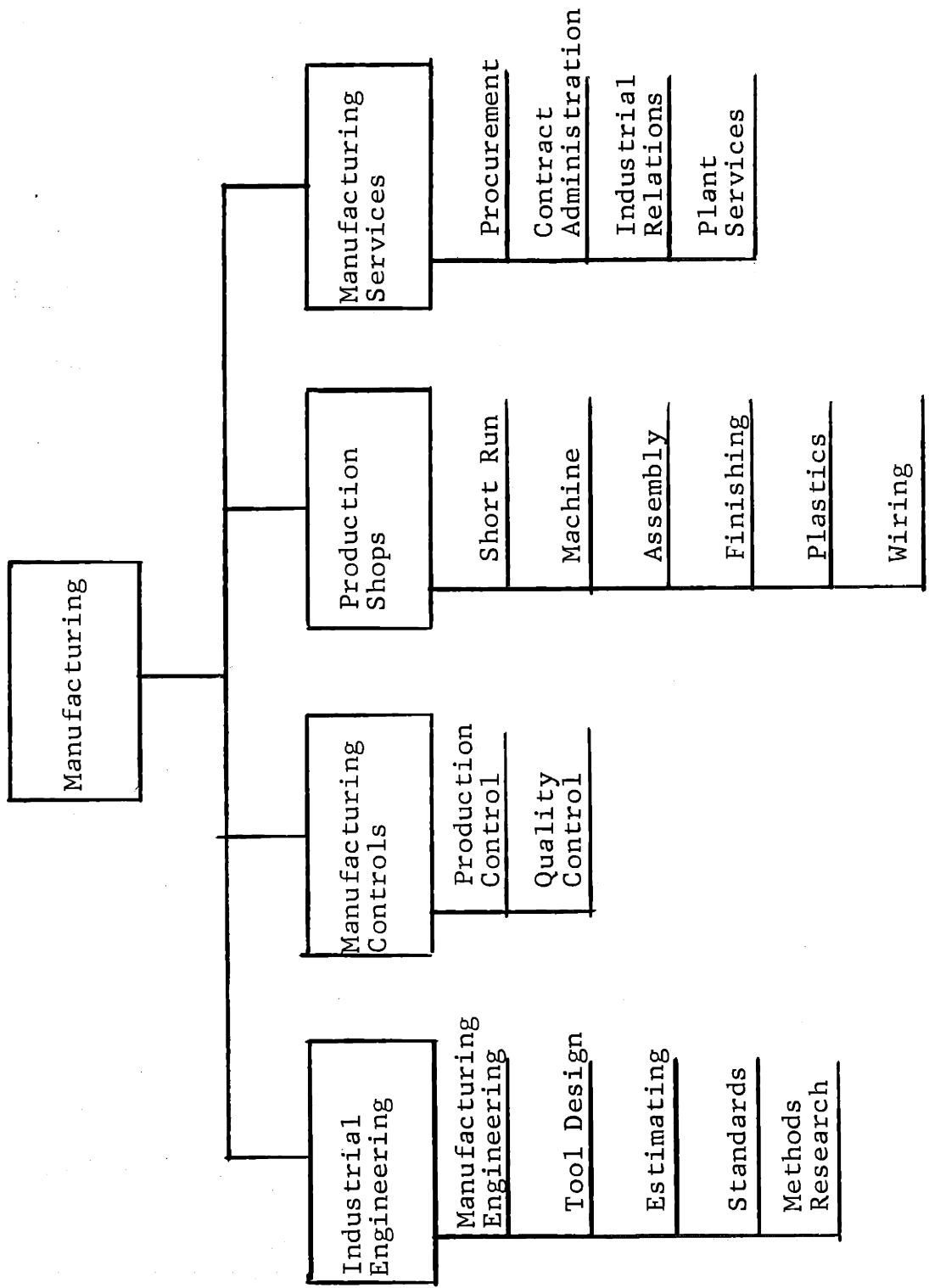


FIGURE II MANUFACTURING ORGANIZATION

groups devoted to the company's four product lines. These four groups constitute the backbone of the company's business endeavor. While it is true that Manufacturing contributes a major portion of value added and profits, the four product line engineering groups are the most important groups in that they have the only work that could not be subcontracted since the company's competitive position depends upon technical leadership. In support of these groups the Product Engineering Group provides common engineering services such as mechanical design, reliability, servo design, packaging and drafting. Each of these have a sub-management structure. Project Engineering provides services in the form of program management and scheduling to interface the engineering product line groups with other contributing groups and their respective customers. Since this is one of the coordinating groups its functions will be discussed in more detail later. Technical services include documentation, reproduction, a library and a program center to record program status on all efforts. Engineering also has a Model Shop to produce engineering feasibility and prototype models. It in turn is also subdivided with specialty groups with their own supervisors and foremen.

To explore the management problem further it is meaningful to describe the operation of one of the four product line engineering groups. The Electro Optics

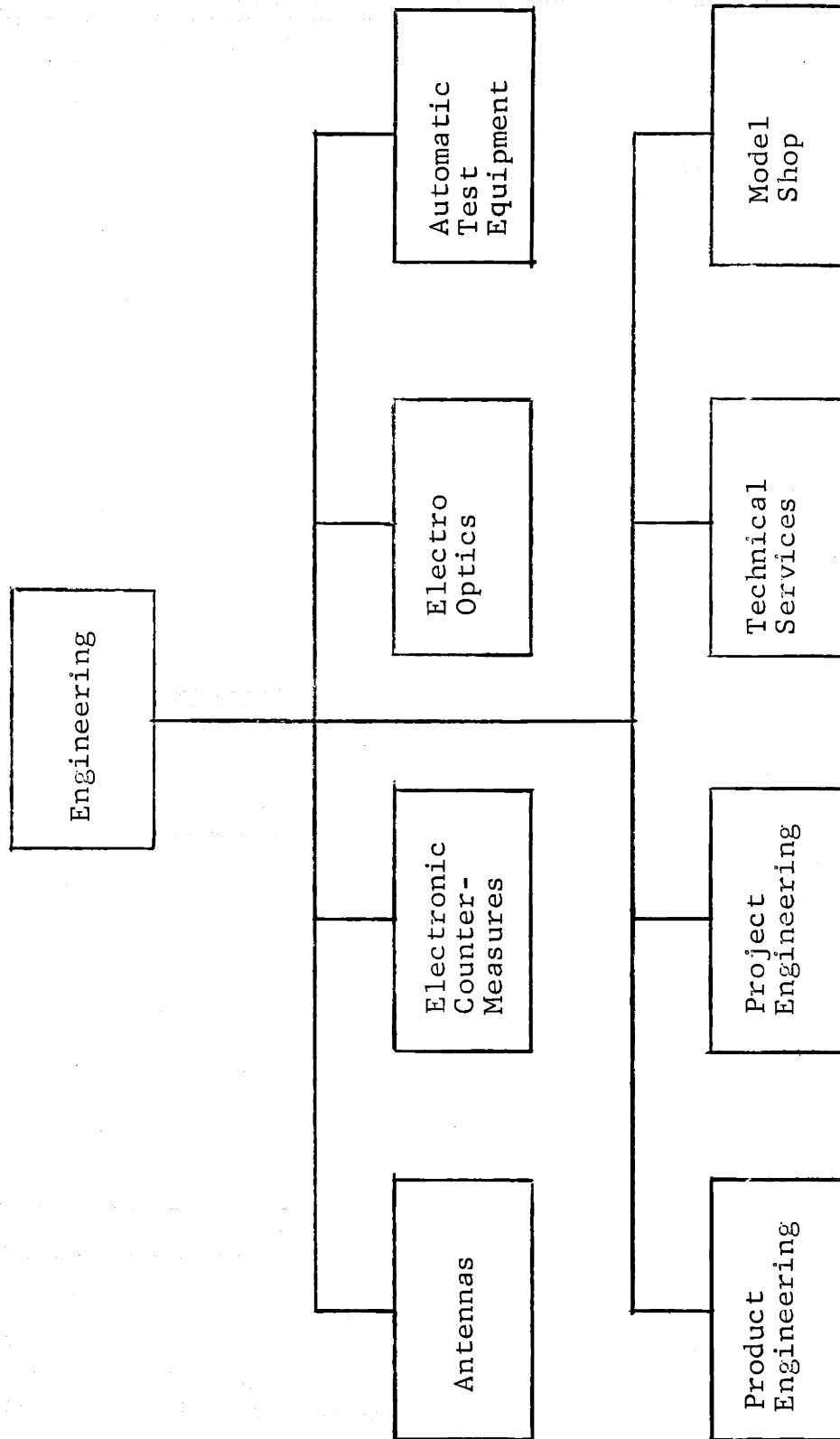


FIGURE III ENGINEERING ORGANIZATION

Engineering organization is typical and is illustrated in Figure IV. The "XYZ" Program is of sufficient magnitude and duration to require centralization of talents for efficiency. In this case all contributors are brought together under one manager to perform the task. Other smaller jobs come under respective Program Managers in the Infrared and Television Systems groups. In these cases there are other contributing groups which do not report directly to the Program Manager. There is also an Advanced Electro Optics group whose responsibility is to advance the state-of-the-art by developing new products for the company's future. This work is usually done on company funds. In addition, due to some unique circumstances there is a Special Projects group. A product line engineering operation of this type will comprise from five to ten per cent of the total company's personnel and it will consist of sixty to seventy per cent professional employees.

Referring to Figure I (page 11), it is seen that the Executive Vice President also supervises Program Management. Its responsibility is to provide a coordinating service between the customer and the company per contract on major programs. It schedules tasks, allocates budgets and coordinates activities between Engineering and Manufacturing and in addition works with the customer in making changes in design, schedule, quality, etc., as required either by the

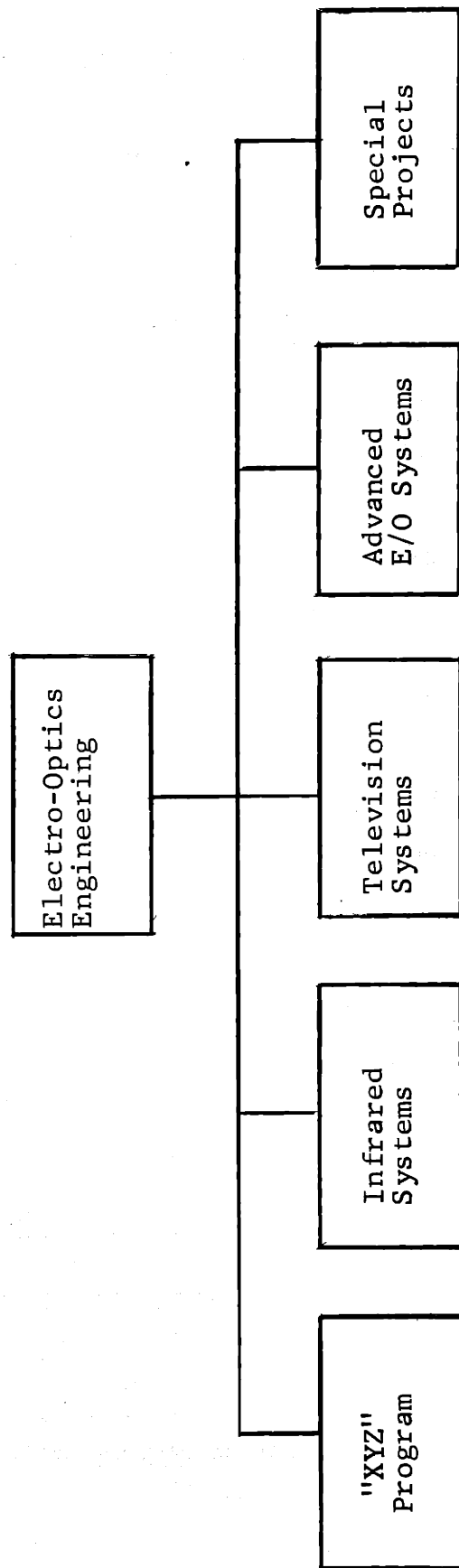


FIGURE IV A TYPICAL PRODUCT LINE ENGINEERING GROUP

customer or by the company to satisfactorily supply the end product.

There are a multitude of service (Payroll) and futures (Market Research) groups in the company which have not been delineated above since they are not relevant to the problem under consideration. These groups usually operate satisfactorily since their efforts tend to be more autonomous and do not require day-to-day integration with other components of the company. The middle management problem revolves around the integration of the "Mainline" specialty groups which must work closely together to complete contracts.

Program Integration

Once a contract is awarded to the company, management reviews the effort and determines who within the middle management structure should be the Program Manager and have the responsibility to carry the entire effort through the organization. If it is a medium sized effort with significant development content a product line project engineer will be named as Program Manager. He, in turn, will establish PERT/COST (2) schedules with the assistance of all lateral contributing groups in Manufacturing, Drafting, Documentation, Accounting, et cetera. Each of these latter organizations will appoint one man as its representative on the program team and he in turn will be responsible for his own specialty

areas contribution to the effort. It is through the project team network headed by the Program Manager, that lateral integration is provided to bring all necessary specialty talents to bear in performing on the contract.

Similarly if the job is production oriented, for example a spare parts order, program management will rest with a Program Manager whose line responsibility is in Manufacturing rather than Engineering. Likewise if the principal problem is customer satisfaction the Program Manager will be assigned in Marketing or Contract Administration.

If the job is large or has significant future business impact on the company a full time Program Manager will be assigned and he will report directly to the Program Management Office. While he laterally "buys" efforts from the necessary specialty groups throughout the company he is directly supported in scheduling the costing by a group in the Program Management office.

In all cases a program team is formed by the representation of each participating group. Thus, while the company's line organization is based on technical specialties it is laterally integrated by Program Managers and their respective teams. As was noted above there is one program of sufficient magnitude and duration that all contributing groups have been integrated into a centralized operation and function as an autonomus product operation or "subcompany"

under one manager who is the Program Manager.

Operational Control

To control the job the Program Manager establishes schedules and budgets for each contributing group and he integrates these plans into a master schedule and budget. Accounting opens an inventory account for the job and establishes separate charge numbers for each group. As charges are incurred via time cards and material purchase orders they are compiled and expenditure reports are distributed on a weekly basis to the Program Manager and other responsible individuals as necessary. Variances in actual expenditures versus budgeted time-cost performance are included in the report on a group and total program basis. Since Accounting only supplies historical expenditure reports the Program Manager usually establishes a man to record all major purchase and subcontract commitments to assist in the control of the job. If large variances occur the Program Manager has access to more detailed accounting information as required to define the problem and take necessary corrective action. While the Program Manager develops his cost data from accounting records and his own cost commitment records he must utilize personal judgment in accessing per cent task completion for each PERT task.

To control overhead each higher level line manager

receives a monthly expenditure report on his total operation. The report includes line item overhead expenditures, budgets and variances on both a current month and year-to-date basis. This report also includes a direct labor statement which indicates the total labor dollars charged to jobs by his group. As in the case of Program Managers, the line manager has access to more detailed accounting records should variances be large enough to warrant further scrutiny.

Problem Manifestation

Through evolution, management's approach to the problem of controlling activity has been to establish various offices to coordinate the company's specialty groups. Referring to Figures I through IV we find the following offices:

"ABC" PROGRAM

PROGRAM MANAGEMENT

PRODUCTION CONTROL

CONTRACT ADMINISTRATION

PRODUCT ENGINEERING

PROJECT ENGINEERING

"XYZ" PROGRAM

all of which have responsibilities to coordinate activity. In addition, there are a number of other separate lateral control offices not illustrated such as: Assembly Control Supervision on the "XYZ" Program in Manufacturing, a project

Control Room for Executive management in Engineering, Cost Control in Engineering, Program Reports and Analysis in Accounting, et cetera. This is not to say that these organizational entities are not necessary for internal coordination but are cited to illustrate that the problem of control is real as manifested by the number of offices which have evolved within the company to cope with the problem.

The Problem

A middle manager is in an interesting position; he may be an individual contributor on projects A, B, and C, program team member reporting to the Program Manager of project D, Program Manager of projects E and F, writing proposals and making cost estimates and working with the customer on projects G, H, and I, all of these simultaneously while being held responsible for his line specialty operation and its future. It is not unusual for a single individual to have this many project responsibilities. Some simple extrapolations are enlightening; there are currently some 160 contracts in house, some 30 company sponsored R&D efforts and perhaps 70 proposals in various stages of completion giving a total of some 260 efforts to be coordinated. While a good many of these are small and require little integration the average contract requires the contribution of four specialty groups. Thus, there are about

1000 integrating contracts to be shared between about 100 middle managers giving an average of about 10 lateral integrating efforts for each middle manager. It is to be noted that daily changes occur on many efforts as the job progresses. It is not surprising that these men spend a good deal of their working day in coordinating meetings and do the major amount of their administrative and technical work after hours.

Now that we have explored the mechanical features of a middle manager's job, let us view it on a personal level. The only continuity provided in his job is in his line position. The communications he receives laterally are frequently ambiguous, in conflict and are always temporal. As a result he tends to concentrate on one or two efforts in his prime interest area and will not support other groups. The converse is also true; he finds it difficult to obtain support from other groups for programs on which he is Program Manager. Viewed from the outside he often appears as a competitive politically inclined individual whose only interest is promotion. Viewed from the inside he is frustrated in attempting to get his job done when he has virtually no control over contributing groups or his customer. He is always under schedule and cost pressures in a continuously changing environment and, as a result, is overworked and has little

time for free thinking or enjoying the pleasures of accomplishment.

A few quotations by middle managers gleaned by the writer while discussing the problem at the model company give additional insight;

A Manufacturing Manager, "We just don't have good communication, people in Production Control (also Manufacturing) just don't understand my staffing problems."

An Engineering Manager, "When the Program Manager (not in Engineering) committed us to the customer for earlier delivery I just told him to go to . . . , that . . . didn't even ask me about the change. I don't know how he is going to solve his customer problem but it's his, not mine."

From a Manufacturing Foreman, "I don't really have any problems, I just do what I am told and no more. But you should go talk with the managers on the . . . program, all they do is keep their skirts clean so they will be promoted."

From an Engineering Manager, "Every time I go to Drafting (also in Engineering) they give me their worst draftsmen"

From a Lead Draftsman, "They always come here expecting me to get something out yesterday"

From a new Program Manager in Engineering (who almost

cried from frustration during the interview), "This . . . company, I got this contract for them and now I can't get anyone to work on it, they are all busy on their own projects. They give you all the responsibility but no authority."

In summary, the management problem we are attempting to solve stems from the need for better lateral coordination to perform on temporal contracts in a quasi-static, vertical specialty organization in which the players perceive continuity of reward and promotion in the vertical structure and conflict and ambiguity in the horizontal structure. The result is group competitiveness and mutual misunderstanding and distrust resulting in intergroup friction less than optimum job performance and frustration.

CHAPTER III

ECONOMICS OF ORGANIZATION

Introduction

In the previous chapter we examined the middle management conflict problem in a model job shop firm. In this chapter we will explore the dimensions of management's flexibility in adapting the organization to more satisfactorily fulfill its responsibilities. We will evaluate organizational constraints imposed by economy of scale which result in middle management conflict. Can the organization be changed in some way to alleviate internal conflict while simultaneously increasing or at least maintaining present efficiency?

Learned, (3) has discussed the available managerial action which may be taken to cause organizational change and has categorized them as; reorganization, changes of leadership, changes of resource allocation and changes of reward structure.

Reorganization

Bain (4) and Robinson (5) have defined the basic economic determinate of organization as economy of scale. To be competitive, an organization must be structured for maximum gain of scale in producing its product. Through

evolution, i.e. survival of the fittest, many different types of organizations have developed (6). While these many detailed types appear to be different they can all be classed on an economy of scale basis. In each case the organization is structured for greatest economy with organizational clusters about a common factor and each cluster has its own objectives. Examples of common factors are; large capital investments such as a blast furnace whose objective is to produce steel, an expertise area such as purchasing whose objective is to buy materials or a geographical district sales area such as California, whose objective is to sell the product in a particular region. Within these clusters other economic subclusters exist and so forth down the line until the lowest organizational level is reached.

As described by Zannetos (7), each organizational cluster, from the highest to the lowest, has its own particular objectives to meet in satisfying the firm's needs. All of these objectives, taken together, are the firm's objectives. The economic clustering results in suborganizations whose objectives and activities must be integrated to perform a task. Thus, differing objectives of various units within the hierarchial structure must be provided with lateral coordinative control. This is the essence of the need for management control--it is not in the need for, or the misuse of, power--it is for economic production. The

genesis of this thesis is the need for lateral integration.

Returning to Learned's four methods of change, we ask, "Can the conflict be alleviated by reorganization?" Through evolution, a job shop or batch manufacturer is organized by specialty clusters rather than job clusters since this gives the greatest economy of scale. This is due to the short term nature of jobs to be done. A job shop organized on "job cluster" basis in which all necessary resources were centralized under one manager for each job would result in a most inefficient organization since the problem of efficient transfer of resources between jobs would be impossible. In this case lateral coordinative control would appear as an even greater problem and inter-group conflict would be magnified as disagreements arose over what job obtains what resource at what time. These two clusterings, specialty and jobs, appear to be the only possible alternatives in the model company.

Choosing the lesser of two evils, the problem in the job shop organization is to provide lateral job coordination. Lateral coordination of all efforts on all jobs cannot be done by top management since, as we see in Chapter II, there is simply too much coordination required. Thus, coordination of subgroup activity is delegated to Program Managers who have responsibility for successful job execution but no direct line influence over participants.

In addition to a lack of line authority the Program Manager cannot use his budget authority effectively since he is buying service from specialty centers which in effect are monopolies. He is not at liberty to take his business elsewhere. These specialty centers can, to a limited degree, react at will to the various Program Managers purchasing their services. The only recourse a Program Manager has, if his needs are not satisfied, is to go up through several levels of organization to a common superior and back down to the specialty group.

It therefore appears that job shop manufacturers are most efficiently organized on a functional basis using a lateral "overlay" program management structure to provide job integration. The problem is to provide the overlay management with a better control mechanism over contributing specialty groups to induce greater responsiveness. The answer to the problem of this thesis may not be attained by reorganizing the economy-of-scale clusters--therefore, based on Learned's model it must come through change of leadership, resource allocation or the perceived reward system.

Change of Leadership

The second method of inducing change in the organization is by changing leadership. This does not appear to be a reasonable solution to the conflict problem since it

can be assumed the model company has at least average competence at the middle management level. The company has a good reputation and its salary scale is comparable to other firms in the same business. Furthermore, when new managers are hired they tend to have capability equivalent to existing personnel, and when managers leave the company they tend to receive equivalent or higher level positions.

In addition, managers from other job shop firms have expressed the same problem and at least one (8) continuous line manufacturer has reported middle management conflict. Thus, there appears to be only two remaining alternatives; change of resource allocation or change of reward structure.

Change of Resource Allocation

Change of resource allocation in a firm expands or contracts existing groups or it establishes new groups. This type of change will enhance or decrease a group's ability to fulfill its objectives. If the coordinating offices of Chapter II were given more funds to control the efforts of the contributing groups, there would probably be no material change in coordination efficiency since additional coordinators would necessarily consume more of the middle manager's time at the expense of direct communication with the program team. The number of interfacing positions would be increased on each job and paperwork would

further increase. Furthermore, this is the solution management has been using to improve coordination but the problem remains.

It therefore appears that change of reward structure is the only managerial action which offers real hope in solving the problem.

Information and Control

In order to provide control of the firm, and thereby realize economies of scale, management must have an appropriately designed information system. If top management is unaware of overloaded groups or idle areas, or if middle management is not aware of forthcoming efforts, job status, et cetera, inefficiencies will result. The purpose of this section is to briefly describe the management information system needed for the control of a job-shop firm. The system set forth here will also be used to yield data for the incentive reward plan as discussed in the next chapter.

Management establishes strategic plans based on the environment, the company's strength, and the desires of the stockholders and managers.* (9) These plans set the guidelines for operational control. (10) Traditional accounting information systems yield historical data on

*This may or may not be an intuitive process depending on the company.

1) costs by functional responsibility center, 2) full job costs on work performed, and 3) direct costs on work performed. These measures are needed for effective control, the first for overhead and resource allocation, the second for pricing and the third for pricing in special circumstances and to measure productive efficiency.

With the development of the computer and the rapidly changing environment other formalized internal information systems are being designed to yield information on all fluid factors in the organization; equipment, personnel and materials and parts status (11). The status of these factors should be measured with respect to operational plans which have been established to perform jobs. The plans, of course, would be continuously modified by the availability and status of the fluid factors and by external perturbing influences. Information from this total network would be used by management as follows: 1) Manpower loading would be done by the individual task requirements to most efficiently complete all jobs, labor shortages would be noted in advance and workers could be recruited; conversely, surplus labor could be laid off. 2) Equipment down time would be kept at a minimum due to proper scheduling and equipment could be bought or sold as needed. 3) The status of all materials and supplies would be known, thereby minimizing the need for excessive inventories. 4) Better prediction on job completion

dates would be available. 5) Job status, on a per cent completion basis, would be more accurately known and when compared with actual costs and budgeted job costs, necessary remedial action could be taken. 6) The data would also be of use to the first line of management on a day-to-day basis for determining the tasks to be accomplished with each machine and man.

Unfortunately full scale information systems of this type are still evolving and are not yet economically available. They will probably alleviate some middle management conflict since the computer output (in effect the result of a much enlarged "cognitive field") will be much more accurate in highlighting the real problems for integrative managerial action. The computer output will probably also provide a focusing mechanism on job execution as opposed to vertical group security. Notice that all of the above data are currently being processed by managers in one way or another. As this data reduction is automated managers will be freed of many day-to-day chores and will be able to concentrate on more meaningful problems. Specifically they will be able to turn more attention to less tangible but highly meaningful measurement, tasks and problem resolutions such as workers job satisfaction and overall group efficiency, the "human costs" as discussed by McGregor (12) and Likert (13).

As computerized information systems become even more sophisticated they will provide a higher degree of viability for the firm in adapting to the changing environment. Proposals for this have been made (14, 15) and with the rapidly increasing change of pace more sophisticated information and control systems will become increasingly necessary (16). It is doubtful if computers will be able to solve problems which cannot be formalized in the near future however, their immediate role will be to extend man's cognitive limits by accurately reducing large quantities of formalized data on a near instantaneous basis (17).

While more sophisticated computer information systems hold much promise and will significantly change managerial control techniques they are not yet obtainable and until they are integrative control in the job-shop firm must remain with the middle managers.

As was noted in Chapter II, PERT/COST records are used in the model firm and Accounting keeps records as outlined above on a responsibility center, direct cost and full cost basis. The remainder of the necessary information to integrate groups, and to implement an incentive plan, is generated and disseminated by the various coordinating groups also outlined in Chapter II.

Conclusion

Of the available managerial courses of action only

change of reward structure appears to offer promise in solving the problem of middle management conflict. Reorganization will not provide an efficient approach due to loss of economy of scale. Changes of leadership or resource allocation will not affect the problem.

The current organization, vertically structured upon functional discipline with a lateral overlay of program management, is the structure needed to provide efficiency and yet it is because of this structure that inter-group friction is generated. Computerized information systems offer much future promise for managerial control and will most probably alter the problems now perceived. However, until these systems can be implemented, change in the reward structure is the only promising approach. Current accounting and program management information systems yield adequate data for implementation of an incentive plan.

CHAPTER IV

ORGANIZATIONAL BEHAVIOR

Introduction

As shown in the previous chapter, the problem we are attempting to solve requires a change of reward structure to achieve better lateral group integration on job execution. This is a problem in dealing with people and groups of people in an organizational environment. If a satisfactory long term solution is to be found, it must rest upon man's basic characteristics and must embellish and promote these characteristics. Any other strategy in organizational design would ultimately lead to failure--management gimmicks will not work in the long term. The purpose of this chapter is to examine man's basic motivations and behavior in an effort to define criteria to be used in controlling the organization.

Unfortunately the behavioral scientists do not presently have, and may never have, a clear image of man's characteristics. However, much fundamental work has been done and it is better to work with these empirical results and hypothesized models, though incomplete, than to press forward on intuition.

This chapter first views man as an individual, then considers the problems encountered in integrating man into

the organization, then examines intergroup relations and concludes with a definition of man's characteristics for use in solving the problem at hand. Throughout the discussion, unless otherwise stated, it is assumed we are considering an educated, managerially oriented man in the United States today.

Man's Behavior

Atkinson has stated (18) that the strength of man's tendency to act in a particular way is a function of three independent variables multiplied together. The variables are: the strength of his innate motive to act in that direction, the expectancy of achieving the goal, and the magnitude of the perceived reward when the goal is achieved. Stated mathematically:

$$\text{Behavior} = \text{Innate Motivation} \times \text{Expectancy of Attainment} \times \text{Magnitude of Incentive}$$

Behavior, which results in activity, is what management attempts to control for the benefit of the organization. Thus we must explore the meaning of the three variables which yield behavior.

Another view of the above equation can be gained by a spatial separation of the three variables; man's basic nature, his awareness of things, and his environment; A) Man's motivations are internal (19) he has no control over these basic drives, however, he can control his actions

since he has a will but this leads to anxiety (20). Thus, insofar as possible any management system should be designed to be in constructive accord with man's motivations to lessen anxiety. B) Man's expectancy of attainment is constrained by the limits of his cognitive field which forms a limiting barrier between himself and his environment, thus, he can only work on one item at a time, he can only learn at a certain pace, and he can only perceive at a given rate. If attempts are made to exceed these limits, man will perceive conflict and ambiguity and frustration resulting in activity breakdown. Thus, in designing an organization, management must be careful not to expect too much from the individual and care must be taken in constructing the stimuli to make clear to the man the desired results. C) Incentives, unlike the other two variables, are an entirely "outside world" environmental factor to man. In establishing the magnitude of the incentives, pecuniary or otherwise, management must remember that other non-controllable incentives are present. Thus, incentive magnitude must be established sufficiently high to induce desired behavior.

The above generalized statements define the basic forces at work inducing man's behavior. In order to establish criteria for use in developing and evaluating a new reward structure we must explore these forces further. A major portion of the remainder of this chapter will be

devoted to this exploration.

Man's Innate Motivations

The earliest theories of man's motivations came to up from the Greeks (21) who argued that man is attracted by pleasure and repulsed by pain, the teachings of hedonism, as the theory is called, did not change markedly until the early nineteenth century when philosophers such as James Mill modified it by arguing that the only real happiness is the happiness of the community. Unfortunately, hedonism in either the individual or social form does not yield an adequate model of man's motivations for predictive behavior analysis. A better model is needed for organization synthesis since motivations are much more complex.

Freud (22) entered the field in the late nineteenth century with his theories on man's life and death instincts and sex and aggression drives. While no one can argue the existence of these motivations they are still insufficient in fully explaining man's behavior in an organizational environment.

Today's understanding of man's needs is fully described by Murray (23) in which he divides man's motivations into homeostatic, sexual and social. Only the latter is of interest in this study since social motivation is the main determinant of man's behavior in the industrial organization.

There are two recent theoretical models of man's motivations which are useful in predicting his social behavior in an organization. One, hypothesized by McClelland (24), defines three independent social needs exhibited by man. A need for achievement, a need for affiliation and a need for power. Thus, man is driven to accomplish things, to associate with others and to control others. The strength of these individual needs vary with the individual and are a determining factor in the type of work a man will find satisfactory. For example, a man with a high achievement need will be drawn into jobs in which he can see quick tangible results for his efforts such as engineering or marketing, a man with high affiliation needs will tend more toward social work, and a man with high power need will tend to seek promotion opportunities.

The impact of McClelland's three dimensional model on the problem of this study is readily apparent. Given that man has these innate motivations, and given the behavior model of the previous section, man will respond along McClelland's three determinants in the direction he perceives as offering the highest reward. Therefore, in a company as described in Chapter II in which the managerial structure is based on technical specialities and in which man's reward comes primarily from the permanent hierarchial structure he will tend toward his power need at the expense

of his affiliation or achievement needs. The leaning toward power will be exhibited by "promotion drive" and competitiveness. To get the company's job done more efficiently requires a greater use of the affiliation and achievement needs. Greater affiliation with peers would result in greater intergroup cohesiveness and greater use of the achievement need would cause each man to devote his energies to getting the job done. Thus, according to the models developed and the problem at hand, a solution can be obtained by restructuring the perceived incentive system from hierarchical promotional rewards to lateral teamwork and job performance rewards. Note that these changes may be accomplished without coercive constraint and result in redirection of activity in harmony with two of man's basic motivations. We reinforce his basic needs and give them a stamp of approval.

Another well accepted model of man's fundamental motivations has been given by Maslow (25). It differs from McClelland's model since it is based on a hierarcial structure. Maslow has hypothesized that man's drives range from security needs through self actualization needs and each must be satisfied before the next is realized. The five levels as interpreted by Schein (26) are: 1) Security--the drive for existence; food, sex, money, physical comfort, 2) Affiliation--the need for social relationship with other men, the need for group acceptance, 3) Ego--a search for

identify, the need to reinforce self-esteem, 4) Autonomy--the drive for individualism, a need to be different from other men, and 5) Self-actualization--the highest form of all--the need to accomplish without apparent reward, the drive to provide a legacy for man.

A half starved Indian in Peru would not exhibit any of these motivations except the first. In the United States, with a higher standard of living, most people appear to have satisfied the first two levels and have penetrated the third level. It is a fair assumption that most middle managers fall in one of the top three brackets. Any reward system should be designed to facilitate expression of these needs. At the third level it should reinforce a man's image and expectations of himself. At the autonomy level it should demonstrate to the man that he is different, thus his incentive should be in accord with his specialty group's contribution instead of an averaged program group reward. At the highest level the reward should emphasize personal contribution to the job. In total, regardless of a man's level of motivation, the reward system should be designed on an individual basis to reinforce man's image of himself and should promote concrete accomplishment.

As in the case with McClelland's model a reward system can be designed in accord with Maslow's hierarchial needs and will reinforce them. The organization described in Chapter II

currently tends to subvert these drives since the managerial reward structure does not reward individual job accomplishment, instead, it tends to restrict accomplishment ("I can't get the other group to work on my project") and is therefore frustrating the man.

Cognition and Expectancy

As stated in Atkinson's model, man's behavior is a function of three variables; motivation, expectancy and incentive. Behavior is goal oriented and expectancy of goal attainment is limited by man's cognitive process. To create desired behavior, management must recognize man's cognitive limits in knowledge, in perception, in capacity to learn and to solve problems.

Inherent in organizations is the recognition of man's limitations, otherwise subgroups would not exist. It is because of man's limited span of knowledge and attention that complex programs are broken into tasks to be accomplished one at a time on a sub-goal basis, this factor is the underlying cause of relative decentralization, specialty grouping, span of control limitations, power dispersion, delegation of authority, in other words it is a central factor in organizational design. Unfortunately, most behavioral science research is directed toward a better understanding of man's needs and little is expended in evaluating man's limitations

and the organizational consequences thereof. March and Simon (27) are two of the few authors to recognize this but their concepts are conjectural and therefore offer only preliminary insight.

In the organization described in Chapter II, sub-groups have been formed on a specialty basis to perform the same type of task on many different jobs. The problem, as discussed in Chapter III, is that the objectives or goals of a sub-group are not generally in accord with objectives of other sub-groups. For example the objectives of sales and of parts production are different and tend to conflict even though both are needed for the organization's total objectives. Furthermore, March and Simon argue that members of a sub-group tend to respond in terms of sub-goals even when their resulting actions are in conflict with the goals of the organization. As an example, an engineering sub-group may be established with the objective of designing circuits for radar systems but the sub-group may evolve additional undesired objectives such as an objective to design and sell circuits as an end product even though other sub-groups in the organization are not prepared to assist them. This sub-goal orientation is reinforced by three cognitive limitations

First, in the individual there is selective reinforcement through rationalization and limitations of

perception. Perceptions that are not in harmony with the individual's existing frame of reference are filtered before they reach consciousness or else subjective interpretation intercedes to remove discrepancy.

Second, the group reinforces itself through internal group communication which affects group focus of information. This results in increased sub-goal persistence since the information has already been filtered by the individual process described above. In addition, since the specialty sub-group consists of people with similar backgrounds and interests, goal perspectives are similar and are not necessarily aligned with the organizations' goals.

Finally, there is reinforcement through selective exposure to the environment. The overall task is divided among the sub-groups on the basis of specialty tasks which affects the information the sub-group receives. Thus, a salesman lives in a world of customers and final test specialists live in a world of product test.

In a time pressure environment the various sub-groups, perceiving the total task through their own sub-task filters generate different perspectives of the same problem which results in inter-group conflict. These conflicts in turn result in sub-group withdrawal (28) lessening communication and understanding which further accentuates the problem. The system is degenerate.

To overcome the degeneracy a new stimulus is needed to penetrate the barriers between sub-groups. Some incentive is needed to focus attention away from the sub-group onto the cooperative task.

Kahn, (29) in exploring the same problem, has devised a model based on the role of each individual in the organization. Each person is linked to those people with whom he interacts in a "role set." These people variously affect the individual dependent upon their relative position of subordinate, peer, superior. Conflict is a function of discrepant expectations among the role senders. Ambiguity is derived from uncertain expectations. Overload is a function of the number of role senders and the number and magnitude of their expectations. As in the case of the March and Simon model a clearer definition of goals made through an appropriate stimulus, would do much to relieve conflict and ambiguity.

Another symptom of cognitive limitation is not explicitly discussed by behavioral scientists. The problem is organizational overcommitment caused by lack of integration of sub-group goals. Each sub-group, stimulated by promotion reward and their hierarchial superiors, makes commitments which, in fact, are total organizational commitments. Since the sub-groups are not in adequate communication the commitments are made in whole or in part on a unilateral

basis. With each sub-group making organizational commitments the total organization is thrust into an overcommitted position which is degenerate since top management is too busy resolving today's overcommitment problems and do not have sufficient time for planning to properly set overall organizational goals to constrain and blend sub-group commitments. Furthermore, top level management, in resolving today's problems, tend to reach too far into the organization and while they may correct the problem on one task the solution oftentimes is at the expense of other concurrent tasks which creates more problems.

Thus, the top level management, instead of setting organizational strategy and goals, are forced to continuously react to today's problems often in an inefficient fashion. By providing stimuli to the middle managers to solve today's problems by performing on today's jobs, top management will be relieved of lower level integrative efforts and may then concentrate on tomorrow's strategy.

Reward Structure

We have now explored two of the three variables in the original behavior model. The innate motivations of man and the limitations imposed by man's cognitive field have been explored. The third variable, reward, is unique in comparison with the other two since it is the only one

which is a management decision variable. The first two variables are independent and cannot be changed at will by management. Therefore, based upon the arguments of Chapter III and the arguments of this chapter, the only change management can make in resolving the problem is a realignment of the reward structure.

Much has been written of the results of various pecuniary incentive plans. So many plans have resulted in even poorer performance than existed before implementation that most of today's organization behavior scientists (12, 13, 30, 31, 32) regard them as detrimental and tend to condemn their use. The most significant research on incentives was done by Likert (13) and associates at the University of Michigan in which some nearly identical groups--some with dollar incentives on work output, some without--were compared for morale and work output. While there were many perturbing influences, the most important being the supervisor/group relationship, Likert's data conclusively show poorer performance in the groups where dollar incentives were used for increased work output. This study, as in other cases, shows that improperly applied incentives are detrimental.

Argyris (33) has clearly defined the problem. Referring back to our behavior model and to our motivation model of man by Maslow, the result becomes obvious. Money

is lower on the motivation scale than affiliation--people in our society do not need money as badly as they need group acceptance. As Argyris argues, the reason productivity decreased in Likert's experiments was that the dollar incentives for work output highlighted individual differences, and higher producers were shunned by the group until they adjusted to the group work norms. Furthermore, group cohesiveness was strengthened and still lower work norms were established in retaliation to management. Similar analysis can be applied in other cases where incentives have failed. This gives insight to the strength and meaning of pecuniary incentives. Money offers a universal quantitative measure of performance. There is no question as to the measured performance level; telling Joe Smith that he has done a fine job on efforts A, B, and C but that he should watch D & E is easily rationalized by Joe Smith and it is not visible to his peers--paying Joe Smith only sixty per cent of his potential incentive is visible and is not easily rationalized when his peers receive one hundred per cent.

Maslow is probably correct in placing the need for money at the bottom of the scale but its use is second to none in providing a quantitative "scorecard" measure to reinforce and promote other higher needs. In Likert's case it promoted group cohesion to the detriment of the organization. Other non-pecuniary rewards have already been tried with only

marginal success. These include a multitude of communication efforts; the company paper, posters, organized review meetings, personnel appraisals, memos and the like but the problem remains. The answer is in offering a crystal clear incentive to direct attention in the direction of problem solution. The dangers in financial incentives is in implementation--this is the subject of Chapters V and VI.

Groups

The first part of this chapter has been devoted to man's behavior as an individual. Group establishment and group interaction are of equal importance in determining criteria for the development and evaluation of an incentive plan. McClelland and Maslow tell us man is motivated to seek affiliation and group acceptance. It is meaningful to determine the factors which induce group cohesion to evaluate the factors working in favor and those working in counter-purpose to the solution of our problem.

Much has been written on the forces inducing group behavior (34, 35, 36, 37, 38), nearly all of which has been brought together in five hypotheses by March and Simon (27); 1) The greater the perceived prestige of the group the stronger the propensity of an individual to identify with it and vice versa, 2) The greater the extent to which goals are perceived as shared among members of a group, the stronger

the propensity of the individual to identify with the group and vice versa, 3) The more frequent the interaction between an individual and the members of a group, the stronger the propensity of the individual to identify with the group and vice versa, 4) The greater the number of individual needs satisfied in the group, the stronger the propensity of the individual to identify with the group and vice versa, and 5) The less the amount of competition between the members of a group and an individual, the stronger the propensity of the individual to identify with the group and vice versa.

Thus, group cohesiveness is strengthened with prestige, perceived goals, frequency of interaction, commonness of need satisfaction and limitation of competitiveness between the individual and the group. The "group" we are considering is not the existing heirarchical specialty group, since they are already cohesive, rather the group we wish to strengthen is the program team as defined in Chapter II.

A monetary incentive established at the beginning of a job should be a positive factor inducing all of the above to achieve group cooperation. The very fact that management places a monetary reward on successful job completion increases the prestige of the effort over conflicting efforts. Most important, a dollar incentive system tied to successful job completion clearly and quantitatively identifies goals-- there is no confusion as to the desired result. In an effort

to increase the incentive reward, greater interaction should occur since the sub-groups are interdependent and in order to get the job done efficiently the sub-groups must communicate more frequently. As discussed previously in conjunction with both the McClelland and Maslow models the overall desired result is not in conflict with man's needs--rather the sub-tasks and the overall effort on a job provide a medium for fulfillment of these needs. Competition between the sub-groups should decline when the members of the job group realize that they are mutually dependent in getting the job done to receive the reward. Therefore, based on the March and Simon hypotheses there appears to be no negative factors in using a monetary incentive to induce group action and in fact, each of the group centralizing forces is enhanced by incentive reward.

Job Satisfaction

Thus far this chapter has been devoted to an exploration of man's hypothesized behavior and possible modifications thereof by changing the reward structure. The discussion has not considered present day teachings in the problem of integrating man with the organization. This section will describe these beliefs and will discuss job satisfaction.

At the turn of the century Taylor (39) conceptualized the role of man in the organization as a useful productive

adjunct to the machine--and automation. With his work "Efficiency Engineering" was born. In the 1930's Mayo (40) and his associates and in the 1940's Lewin (41) extended this concept with the recognition of man's affiliation need as a motivating force. They began to consider the industrial organization as a social system as well as an economic/technical system. The power of the organization in subverting man was popularized by White (42) with his book, "The Organization Man" which made a contemporary analysis of the problem but offered no solutions.

Approaches to the resolution of the conflict of needs of the organization and the needs of man have recently been offered by McGregor (12) and Argyris (43). Both proponents approach the problem from man's motivations and they have much in common. Participative management is their underlying idea in formulating the new approach. McGregor has dichotomized the old with the new with his Theory X versus Theory Y styles of management. A Theory X manager perceives the organization consisting of two groups--the lazy, untrustworthy, money motivated, calculative masses and the trustworthy, broadly motivated, elite group who must organize and coercively control the organization. A modern Theory Y manager recognizes that man is best motivated by creating an organizational environment in which all members can achieve their own goals best by directing their efforts toward the

success of the enterprise.

In implementing the Theory Y approach McGregor suggests the use of an incremental reward to emphasize excellence and responsibility and also group rewards for achievement of objectively measurable economic results. Thus, an incentive system designed to enhance man's basic characteristics, emphasizing excellence and responsibility, and given on a group performance basis is compatible with a Theory Y management style.

Argyris divides the problem differently, instead of focusing upon styles of management he comes directly to grip with the problem of integrating the individual's needs with the organization's needs. He argues that the effective leader can successfully fuse the organization's and the individual's needs in such a way that a harmonious optimum position can be obtained.

While this is at best a compromise accommodation, and probably the most effective mating, it will no doubt still leave some individual personal conflicts, anxieties and frustrations. Argyris does not attempt to define the degree of congruence obtainable. Like McGregor his suggested management style is participative. He recommends a reward system designed to reinforce those human activities that; "1) Increase the individuals' (group's) awareness and responsibility for as much of the total organization as possible. 2) Enlarge

the experience of interdependence with others and with the whole. 3) Increase the control that the whole has over its own destiny."

As will be seen in Chapter VI, the incentive system developed herein fulfills the requirements established by McGregor and Argyris.

Many research efforts (44) illustrate that there is little relationship between job satisfaction and productivity. Even though a worker may be highly productive it does not necessarily follow that he likes his work and vice versa. Herzberg (45) has found that achievement, recognition, work itself, responsibility and advancement are positive factors in producing job satisfaction whereas hindering policies, incompetent management, inadequate recognition, salary and poor interpersonal relations are negative factors.

Interestingly, the factors leading to greater job satisfaction involve doing the job, whereas, the negative factors stem from potential organizational constraints. Notice that Herzberg's positive factors are generally in accord with the Maslow model and with both McGregor and Argyris. Thus, if an incentive system is designed in accord with their principles we might expect some increased job satisfaction. The negative factors, the constraints of the organization should correspondingly subside since the prime organization hinderances in getting the job done are the

existing inter-group barriers and lack of cooperation. Note also that if an incentive plan is implemented which upgrades the total organizational effectiveness it seems reasonable to expect the intensity of other constraints to recede from their present levels. For example, one of the negative factors is incompetent management. Hopefully, an upgrading of organizational efficiency would attract better managers and the force of this constraint would decrease.

The correlation between job motivation and job performance is generally quite strong (31). Unless the job is extremely complex man tends to produce more as his motivation increases.

We may conclude that with a properly designed incentive system management can change behavior to focus on getting the job done for the firm's advantage and simultaneously increase job satisfaction to the middle manager's advantage. The best of both worlds.

CHAPTER V

THE INCENTIVE PLAN

Introduction

The previous chapters explored the problem of middle management conflict from the point of view of the individual, the economies of the firm and in an actual organization. The major conclusion is that a properly designed incentive reward system is management's best solution to providing increased cooperation. The purpose of this chapter is to define an incentive plan and discuss its implementation and administration.

Individual Incentive Formula

The solution to the problem lies in establishing a laterally integrating incentive to create a spirit of cooperation between various functional groups to get a job done. In Chapter II we saw that each customer contract or job in the organization had a responsible Program Manager and that each participating group assigned a man to be responsible for his group's effort on the job. It is this collection of program personnel which is the backbone of cooperative (or non-cooperative) effort. If these managers, the program team, can be motivated to work more closely together the company's efficiency should increase. It is this team that

will be offered an incentive on a group basis.

There are several factors to be included in the incentive formula. We wish to measure both job performance and job profitability directly. The amount an individual receives should be in proportion to his own group's contribution and his own salary. In addition, it is necessary to include an equalization factor according to job type. This factor is also used as a proportionality factor to adjust the total expected incentive cost to the company's total expected profit. Thus:

$$I = ARGSP$$

where: I = Individuals' incentive pay,
 A = Customer appraised performance,
 R = Proportionality and job type factor,
 G = Individuals' group effort,
 S = Individuals' salary,
 P = Profit made on job.

The customer performance appraisal, A, insures that the product is of high quality. In many cases it would be easy for middle management to fulfill the terms of the work contract with substandard work and reap a large incentive. This is particularly true on development jobs where contract specifications are necessarily inadequate. Development jobs are only done to gain the advantage of larger and more certain profits on future production procurements of items developed.

If the company profiteered during the development stage future production efforts would be lost to the competition. To preclude this the appraisal factor, A, is included. Rather than have management make the appraisal it is more meaningful to go directly to the customer for appraisal for four reasons; 1) middle management might be suspicious of higher level management appraisal, 2) ultimately it is the customer who must be satisfied and if he is making this appraisal middle management will be more responsive to the customer's desires thereby fulfilling everyone's needs, 3) the customer will yield a truer measure of performance, 4) the customer, in appraising performance, will recognize that he is dealing with a company which has his interests identified as a prime motivation and he will become more committed to the company for future work.

Upon job completion the President would send appraisal request letters to both the contracting officer and the technical monitor; on larger efforts requests for appraisal would be sent to more customer representatives to attain a balanced appraisal. Four factors of performance would be appraised; schedule, cost, quality and the company's demonstrated customer awareness during job execution. Each factor would be graded by: Unsatisfactory 0, below expectation 1, above expectation 2 and outstanding 3. In all cases results would be averaged with equal weight for all factors of performance.

This is an arbitrary choice but is as satisfactory as any other criteria until experience demonstrates that a different approach should be used.

A proportionality factor, R , must be made according to job type since profitability, job difficulty (management involvement) and risk do not go hand in hand. Development jobs have more inherent risk, they are more difficult and offer lower profits than spare parts orders. Therefore, on purely research or development jobs $R = 10^{-5}$ (these values are computed in a later section) on development jobs with production input $R = 5 \times 10^{-6}$ and on production jobs where the factory is working from engineering blueprints $R = 2.5 \times 10^{-6}$. This is also an arbitrary establishment of job rates but cannot be further refined until operating experience demonstrates inequity.

Each participant's own groups contribution, G , is best measured by the groups budgeted direct labor input to the specific job. While it would be desirable to measure this as actual direct labor expenditure upon job completion, such a measure would not be satisfactory since it would induce increased direct labor expenditure during the job thereby reducing profit. Measuring budgets has the additional advantage that when budgets are initially established by the participating managers an adequate balance between each group's direct labor budget and overall profit will be made by the group to

maximize incentive and profit. The group in turn, will control each other during the job to maintain profitability.

Notice that this plan does not allocate incentive on a materials purchased basis. It is believed that purchased items and subcontract costs will be minimized as the group strives for profitability. In addition, allocating incentive on the basis of procured items would not be equitable since large fractions of total purchase expenditures are often made by relatively small contributors.

The Program Manager's responsibility cuts across a number of specialty groups and, depending on the job, he may or may not have any contributing personnel reporting directly to him. The factor "G" in his case will amount to $(G + 10\%)$ to compensate him for his additional responsibility. This then brings the total "G" factor for a job to 110% of budgeted direct labor cost.

The next factor represented in the incentive formula is salary. This factor appears since salary is a measure of a man's ability to contribute. In general, the higher the salary, the higher the man's responsibility in contributing to satisfactory job completion.

The final factor P is for the actual pre-tax profit made on the effort as determined by total revenue less total costs and allocated overhead expense. It would be desirable to measure return on investment to maximize earnings per

share, however, this is not practical at the middle management level since resources are shared and should investment be included as incentive measure another complete level of management problems would be created. A profit measure appears satisfactory since the middle manager's are not in a position to indiscriminately invest funds to maximize profits on a single job except in inventory accounts and these cannot be seriously enlarged in a job shop due to crisp scheduling.

Profit Leverage and Total Incentive Cost

The total annual pay of all the managers who will participate is about \$1,200,000 or about 4.8% of annual sales of \$25,000,000. Profit of a Government electronic supplier averages about 4% of sales or about \$1,000,000. Furthermore, normal individual annual salary increase is about 6% (3% cost of living, 3% performance improvement and promotion). To be equitable to all by sharing the risk, it is proposed to place a voluntary freeze on salaries (other than promotional changes) for one year and to establish a goal of 10% of salary payout or \$120,000 incentive pay for 4% profitability. a 10% payout is considered to be an adequate amount based on existing successful plans (30). Since salaries would have normally risen about \$72,000 the company profit decrease to pay incentives is about \$48,000 or 4.8%. In addition there is some cost associated with

administering the plan, perhaps \$25,000. If there were no change in efficiency, in the writer's judgment the plan would cost \$74,000. However, if the middle managers increased their incentive reward to 20% of salary, i.e. if gross profit was doubled, the net profit would rise 80% to \$1,807,000-- perhaps an accomplishable feat if conflict and ambiguity are overcome.

Under this plan, for 4% profitability, the total incentive payout will equal 10% of salaries which is 12% of profit. To compute R a dummy variable Y is introduced:

$$I = ARGSP = AYGS (.12P),$$

$$I_{total} = AY (G_1S_1 + G_2S_2 + \dots + G_nS_n + 0.1S_{pm}) (.12P)$$

where the 0.1 factor is the added Program Manager incentive. The average salary is \$14,000 and G summed is unity therefore:

$$I_{total} = 1.1AY\bar{S} (.12P),$$

$$\text{but } I_{total} = .12P,$$

$$\text{or } AY\bar{S} = .91,$$

and since the average $A = 1.5$ and $\bar{S} = \$14,000$

$$Y = 4.33 \times 10^{-5},$$

$$\text{and } R = .12Y \pm 5 \times 10^{-6}$$

for the average development/production job.

Examples

Taking three different job examples by assuming typical numbers.

	Job #1	Job #2	Job #3
	Engineering Program Manager	Major Program Manager	Factory Team Member
Job type	Devel.	Devel/Prod	Spare Parts
Contract Size	\$100,000	\$5,000,000	\$200,000
Duration	1 year	1.5 years	1 year
% Workload	100%	100%	25%
A	2.0	1.2	1.5
R	10 ⁻⁵	5X10 ⁻⁶	2.5X10 ⁻⁶
G	1.0	(0+0.1)	0.2
S	\$16,000	\$18,000	\$12,000
P	\$5,000	\$200,000	\$30,000
I	\$1,920	\$2,160	\$280
I/year	\$1,920	\$1,440	\$1,120
I% salary/year	12%	8%	9%

The assumptions are; Job #1) The engineer is the Program Manager on a study job with no contributing groups--he pleased his customer and made a sizable profit. Job #2) The major Program Manager didn't do as well with his customer although other measures are satisfactory. Job #3) The spare parts order only constituted 25% of the workload of the factory Team Member but assuming all of his jobs were identical his team's profits are low.

Implementation and Administration

Funds are made available to pay the incentive upon receipt of customer payment for work performed. In addition, freezing salaries for one year will decrease cash flow requirements. As a result it is not necessary to accumulate an incentive pool as is done in the Scanlon plan (46).

Incentives should be paid quarterly rather than

annually to increase the effectiveness of the plan in teaching the participating manager to cooperate to perform on the job. The more frequently a stimulus is applied the faster and the better man will learn (47). More frequent payment also encourages middle management to adhere to schedules and to collect customer payment sooner and more frequently thereby reducing investment (inventory) and increasing earning per share. No incentive payments should be made until the customer has appraised the effort.

Closing the books on a contract usually takes no more than two months after job completion and on long term efforts progress payments are made. On these efforts it is proposed that incentive payments be made at the end of the quarter in which the progress payment is received using the same incentive equation, including the customer appraisal of effort completed, and with an estimated percentage of profit earned according to the PERT/COST schedule.

The company occasionally quotes and is awarded a contract with no profit margin. It assumes these efforts to establish a position in the market place. In these cases it would be necessary to establish a fictitious fair "profit" for use in administering the incentive plan.

All contracts on which a manager participates as a program team member should be included in his "incentive portfolio." Should a loss job occur it should count

negatively, in direct proportion to profit loss, until all of his positive incentive accumulations of that quarter are used after which his incentive will be zero. This deduction will prevent misappropriation of funds from loss jobs to profitable jobs. Although positive accumulations are carried forward until customer appraisal and payment is received and incentive is paid, any negative quarter should be erased at quarter's end. If this were not done a man could get into a long "payback" period and become demoralized. Furthermore, if negative accumulations were kept the managers would shun loss jobs.

In addition to payout of earned incentive and the start of a new incentive period each quarter, all budgets should be reestimated on a quarterly basis. This will achieve two things; first, it will reduce inter-group inequities by periodic establishment of more realistic group budgets depending on the work to be completed at the time, and secondly, it will highlight short term planning to get the job done most expeditiously.

If a man is transferred off of a job during a quarter and another man takes his place, those involved should share the quarter's incentive on a direct labor basis, while each managed the effort. If a man resigns or is terminated he should lose all incentive credit.

Due to the intricacies and possible inequities in the

administration of the plan it is proposed that a new "Incentive Administrator" position be established. The man chosen for the position must be experienced in employee relations, the company's development and production processes and the customer's needs. In addition, he must have already earned the respect of middle management for his objectiveness and sense of fair play. He must participate in all budgeting efforts and must keep all necessary records for the plan. Although he should not have policy authority, he must be given complete adjudicative authority in administering the plan.

CHAPTER VI

CRITERIA TEST AND POTENTIAL PROBLEMS

Introduction

It cannot be stated with certainty that the incentive plan developed in Chapter V will work for the benefit of the firm or the man until the plan is implemented and operational results are obtained. Several qualitative judgments evaluating the effectiveness of the plan can be made based upon the criteria established in Chapters II, III, and IV. In addition, there are other criteria to evaluate the plan. The purpose of this chapter is to make this judgmental appraisal and to describe some additional advantages and some potential problems which might occur upon implementation.

Basic Criteria

Prior to literature search the writer established several basic criteria for a successful incentive plan. Those which have not been stated previously in this thesis are included in this section.

Criterion: "In all aspects the plan must be simple enough to be readily understood and accepted by involved parties." The incentive formula is simple and should be easily understood and accepted by men with sufficient talent to become middle managers. Quarterly payment is not complex

and the program team concept, budgets, schedules, and other management mechanisms already exist. In addition, the existence of an Incentive Administrator will provide a responsible individual to assist in interpreting the plan.

Criterion: "Individual manager's incentives must be designed to maximize profits for the total enterprise and gain in total profit must be greater than the cost of total incentives." Assuming no increase in efficiency, the incentive plan will create a \$74,000 loss of profit, however, break-even will occur with a three tenths of one per cent increase in efficiency.

Criterion: "The plan should make use of the latest techniques of measurement of work output and computerized accounting systems in order to maximize the degree of quantitative measures of productivity." As discussed in Chapter IV after a literature search it is apparent that present day management information systems cannot be used to provide an equitable measure of productivity, therefore the factor "G" (per cent budgeted direct labor contribution) has been used in the incentive formula. While this does not yield a direct measure of productivity it is anticipated that the program team will sense an unproductive group and the team will impose its own discipline to promote efficiency.

Criterion: "A workable method must be devised to implement and administer the plan." The implementation and

administration of the plan described in Chapter V appears to be workable.

Criterion: "Sound criteria must be established for boundary constraints to define; a) Who should be included in the plan? b) How frequently should it be paid? c) How large should the bonus be? d) How should the existing salary plan be modified? e) How should the incentive fund be developed?" a) All middle managers who participate as program team members should be included in the plan with the exception of the highest level management who already participate in the company's previously established return on investment incentive plan. b) It should be paid quarterly. c) Ten per cent of salary as described in Chapter V at nominal profit rates appears to be sufficient to provide stimulus based on existing top management incentive plans. There should be no upper limit as profit increases. d) Other than a first year salary freeze during implementation the existing salary plan should not be modified. e) No incentive fund is required.

Additional Advantages

There are some additional beneficial results for the company should the plan be adopted as follows: The plan utilizes customer appraisal of performance which demonstrates to him that the company is sincerely attempting to fulfill his needs. Furthermore, since middle management job performance

is being appraised by the customer they will become more responsive to his requirements.

In addition to the customer advantage, there is potential advantage in internal investment reduction. It is middle management who deals with the customer in preparing proposals and under the incentive plan middle management will be motivated to increase the number of progress payments. They will also be motivated to adhere to schedules. Both factors tend to reduce investment in inventory thereby increasing earnings per share.

A third advantage lies in increased motivation to obtain high profit jobs since middle management's reward will be greater. Currently, middle management is just as likely to pursue jobs with high technical interest even when profits might be low.

Economics of Organization

In Chapter III we explored organizations and found that the fundamental factor which creates large size is economy of scale. We also found that there is an inherent economic dichotomy which cannot be resolved within a hierarchical organization.

In order to perform on a job, an organization must have lateral integrative control. Based on Learned's model of methods of achieving organization change the only change

applicable to the problem at hand was change of reward system. Both of these factors are in keeping with the incentive system developed in Chapter V.

Organizational Behavior

In Chapter III several criteria were developed for use in establishing the incentive plan. "The plan must rest upon man's basic characteristics and must embellish and promote these characteristics." The following demonstrates that the plan utilizes present day psychological theory.

- A) We explored the model of man's behavior and found the only way we could change his behavior was by changing the perceived reward.
- B) McClelland's motivation model defines man's needs for power, affiliation and achievement. The incentive system redirects man's attention from the vertical power structure to the lateral affiliation and achievement structure, therefore the change is in consort with man's basic needs.
- C) Maslow's model is likewise satisfied since reward is offered as an incentive for his higher motivations of affiliation, ego, autonomy and self-actualization.
- D) Using Kahn's model of role sets the plan offers a focusing mechanism to reduce intergroup conflict and ambiguity.
- E) Cognitive limitation overloads top management resulting in organizational overcommitment. The plan should ease

this overload condition since top management will be freed of some low level integration problems and can apply more time to strategic and operational planning.

F) The fault of ineffective incentive plans was examined and it was found that group behavior induced was detrimental since group cohesiveness was a stronger motivation than the individual monetary incentive. In our case the incentive is given on a group basis similar to successful existing corporate management incentive plans.

G) The program team will gain cohesiveness as a group under the plan using March and Simons' five hypothesis of group identity.

H) The incentive plan also fits the requirements for reward systems specified by both McGregor and Argyris. The incentive will increase the group's awareness and responsibility for a greater portion of the organization since the group encompasses all contributing areas. It also enlarges the experience of interdependence with others and with the whole since in order to obtain the reward the group must interact more frequently and must support each other. The plan also increases the control that the group has over its own destiny since with better middle management integration, top management will not need to intercede as frequently to obtain job control.

I) It can also be expected that job satisfaction will

increase since the positive factors defined by Herzberg are enhanced and the negative factors should subside.

Potential Problems

There are a number of potential problems which might arise should the plan be implemented as in the case of any untested concept. The perceived potential problems are often not the principal source of difficulty. Very often the prime problems arise from forces which have been overlooked by the designer. If the plan is implemented it is absolutely necessary that the Incentive Administrator and other top management observe the progress of the plan very carefully to insure that it is operating as desired.

Most important in an incentive plan is that the people operating under the plan truly accept it. The margin between acceptance and antagonism is very small as indicated by Likert's work. Any perceived inequity by the middle managers will most likely have serious repercussions.

As in any system designed to control a number of variables such as our tax system, our traffic laws, et cetera, there are ways to beat the system. In this case we are dealing with a group of highly motivated intelligent individuals and it can be expected that they might attempt to increase their personal rewards even when the results are not in the best interest of the company. Although

several of the factors in the incentive formula have been included to preclude this, loopholes might still exist; for example, there may be a way to alter job charges between various jobs under the direction of one man to increase his personal incentive. Not only would this completely confuse management in attempting to price products and control expenditures, it would also be illegal. In addition, if more than one manager were doing this the interactive effect with multiple jobs could easily heighten conflict rather than reduce it. To prevent this type of problem it is necessary that Program Managers maintain fairly rigid control of charges on their jobs.

The R factor in the incentive formula was chosen on an arbitrary basis and it may be perceived as being inequitable by different managers and create antagonism. Furthermore, should the concentration of job type change, the company may find that the factor is operating to disadvantage.

Relations with the customer must be watched closely since the types of jobs pursued by middle management or the work performed on jobs might be altered and become detrimental to the company even though offering a higher reward to the individual. With customer performance appraisal included in the incentive formula, the customer advantages discussed earlier in this chapter, and the constraints

imposed by the non-participating higher level line management, this probably will not present problems.

As a final identified potential problem area, non-participating middle managers in service and staff groups must be observed to insure that detrimental effects do not occur.

Again it is to be emphasized that the above perceived problems are probably not the problems which will arise in the implementation of the plan.

CHAPTER VII

CONCLUSION

The incentive plan formulated in this thesis appears to be a viable management mechanism to induce better integration of middle management. The plan satisfies the criteria established by the existing body of knowledge in organizational behavior and economics of the firm. Under the plan it is predicted that the individual manager will find greater work satisfaction and fulfillment and the firm should attain greater efficiency and profitability. In addition to better coordinated task accomplishment, which the plan was developed to provide, there appear to be three further advantages; increased customer and schedule awareness which will increase the company's competitive position, decreased investment requirements resulting in increased earnings per share, and an increased availability of time for top management for strategic and operational planning.

While satisfying the existing body of knowledge the plan may not be as potent a force as expected since the existing body of knowledge is limited and in some cases ambiguous. Furthermore, the plan probably does not provide an optimum solution. To improve the solution research is needed to further refine man's behavior in the organizational environment. This is particularly true in the need for a better

understanding of man's cognitive limitations in relation to the firm's information and control system. In addition, further study and research is needed in economic modeling of the internal operations of the firm with emphasis on the inclusion of man as a prime participant.

The incentive plan is in keeping with the evolution of the firm. As the rate of change of technology and social values increases there is an increased need for a rapidly adapting management structure (15, 16, 48). The keynote is flexibility of response. Groups of individual experts brought together to perform a task then dispersed; each individual flowing from group to group to make his contribution. The reward concept of this thesis offers management a strong tool to create temporal group cohesiveness in a dynamic environment.

As in the case of any managerial change there is inherent risk in adopting the plan. The perceived problems appear to be controllable, however, actual resulting problems could overshadow the usefulness of the plan. Until the plan is implemented and evaluated there can be no quantitative measure of its success. The decision to proceed must rest upon a qualitative judgment of the potential effectiveness of the concept in relation to the appraised inefficiency due to middle management conflict within the firm.

- (1) Armed Service Procurement Regulations. United States Government Printing Office.
- (2) Dearden, J., et al. Management Information Systems. Irwin, 1966.
- (3) Learned, E. P., et al. Business Policy. Irwin, 1965.
- (4) Bain, J. S. Industrial Organization. Wiley, 1959.
- (5) Robinson, E. A. G. The Structure of Competitive Industry. Landon, Nisbet and Co., Ltd., 1953.
- (6) Woodward, J. Industrial Organizations: Theory and Practice. Oxford University Press, 1965.
- (7) Zannetos, Z. S. On the Theory of Divisional Structures: Some Aspects of Centralization and Decentralization of Control and Decision Making. Management Science, December 1965, Vol. 24, No. 4.
- (8) Kay, E. Some Organizational Problems which Arise as the Result of Large Scale Information Systems. TMS, 1966.
- (9) Anthony, R. N. Planning and Control Systems: A Framework for Analysis. Division of Research, Harvard Business School, 1965.
- (10) Anthony, R. N., et al. Management Control Systems. Irwin, 1965.
- (11) Forrester, J. W. Industrial Dynamics. MIT Press, 1965.
- (12) McGregor, D. The Human Side of Enterprise. McGraw Hill, 1960.
- (13) Likert, R. New Patterns of Management. McGraw Hill, 1961.
- (14) Carroll, D. C., et al. Toward the Realization of Intelligent Management Information Systems. To be published in Proceedings of Third Congress; Information System Science and Technology. Thompson Book Company.
- (15) Bonini, C. P., et al. Management Controls: New Directions in Basic Research. McGraw Hill, 1964.

- (16) Bennis, W. G. Changing Organizations. McGraw Hill, 1966.
- (17) Dreyfus, H. L. Alchemy and Artificial Intelligence. RAND Memorandum P-3244.
- (18) Atkinson, J. W. (ed.), Motives in Fantasy, Action, and Society. Van Nostrand, 1958.
- (19) Vroom, V. H. Work and Motivation. Wiley, 1964.
- (20) Rogers, C. R. On Becoming a Person. Houghton Mifflin, 1961.
- (21) Aristotle. The Basic Works of Aristotle. Modern Library, 1941.
- (22) Freud, S. The Basic Writings of Sigmund Freud. Modern Library, 1938.
- (23) Murray, E. J. Motivation and Emotion. Prentice Hall, 1964.
- (24) McClelland, D. A. The Achievement Motive. Appleton Century-Crafts, 1955.
- (25) Maslow, A. H. Motivation and Personality. Harper, 1954.
- (26) Schein, E. H. Organizational Psychology. Prentice Hall, 1965.
- (27) March, J. G. and Simon, H. A. Organizations. Wiley, 1958.
- (28) Festinger, L. A Theory of Cognitive Dissonance. Row Peterson, 1957.
- (29) Kahn, R. L., et al. Organizational Stress. Wiley, 1964.
- (30) Patton, A. What is an Executive Worth. McGraw Hill, 1964.
- (31) Whyte, W. F. Men, Money and Motivation. Harper and Row, 1955.
- (32) Argyris, C. The Impact of Budgets on People. Controllership Foundation, Inc., 1952.
- (33) Haire, M. Modern Organization Theory. Wiley, 1965.

- (34) Olmsted, M. S. The Small Group. Random House, 1959.
- (35) Hare, A. P. Handbook of Small Group Research. Free Press of Glencoe, 1962.
- (36) Bion, W. R. Experiences in Groups. Basic Books Inc., 1961.
- (37) Hamans, G. C. The Human Group. Harcourt, Brace & World, 1950.
- (38) Hare, A. P., et al. Small Groups Studies in Social Interaction. Knapf, 1965.
- (39) Sherif, M., et al. Groups in Harmony and Tension. Harper and Row, 1953.
- (40) Roethlisberger, F. S., et al. Management and the Worker. Harvard University Press, 1939.
- (41) Newcomb, T. M., et al. Readings in Social Psychology. Holt, 1947.
- (42) Whyte, W. H. The Organization Man. Simon and Schuster, 1956.
- (43) Argyris, C. Integrating the Individual and the Organization. Wiley, 1964.
- (44) Vroom, V. H. Motivation in Management. American Foundation for Management Research, 1965.
- (45) Herzberg, F. The Motivation to Work. Wiley, 1959.
- (46) Lesieur, F. G. The Scanlon Plan. MIT Press, 1964.
- (47) Munn, N. L. Psychology. Houghton Mifflin, 1946.
- (48) Myers, C. A. The Impact of Computers on Management. MIT Press, 1967.