The Management Engineer

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THE PROFESSIONAL practitioner of scientific management is the management engineer. Because the profession is new, no standard nomenclature has become established. Practitioners have been variously called management counselors, management consultants, management analysts, business counselors, business consultants, industrial consultants, and industrial engineers, although those bearing the last-named title are more closely associated today with plant layout and production activities than with the field generally.[1] Management counseling was little known until the late thirties. With the development of the social sciences and the *expertise* arising from the application of the scientific method to business problems the profession has advanced rapidly. A growing volume of applied business research, a resulting body of literature, and a methodology and proven results have gained for it a vital and important place in the contemporary business and industrial world.[2, 3] G. R. Terry has stated: "According to the dictionary, a profession is 'a calling in which one professes to have acquired specialized knowledge which is used either in instructing, guiding, or advising others.' It is obvious, therefore, that management is of a professional nature." [4]

The present article is concerned with the nature and scope of this profession, the circumstances which dictate the engagement of a management consultant, ways to insure success in counseling, and the benefits to be derived from the experience. Initially, the paper was intended to be a critical evaluation of surveys of various libraries by management engineers. This approach was abandoned after study and correspondence with consulting firms and librarians, for few reports on libraries by management engineers have been published, and few of those represent solely library studies. One respondent wrote: "In evaluating these studies . . . we trust you will consider the circumstances under which they were written. In none of the cases repre-

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sented by these reports were we engaged to study a library exclusively, but rather, all of the activities of the client government, and the time allocated by the client for the study of library operations was necessarily brief." [5] The attitude of the profession is that the statement growing out of a survey is a confidential report to a client, as shown by the following: "With the exception of the New York Public surveys which have been made available at the client's decision, it is our policy not to divulge the contents of the report except by request or permission of the client. Thus, I am unable to make available to you any of the reports." [6] Libraries, with one or two exceptions, have been unwilling to publicize the reports.

Further, no survey can be evaluated unless the reason for it is known. In several instances other than the New York Public Library surveys, where a library has been studied by a management engineer, the librarian of the institution had not employed the consultant and was unaware of the terms of employment, as he did not participate in the conferences which set the stage for the work. The framework of a survey being thus unknown, the conclusions and recommendations cannot be fairly or accurately evaluated except perhaps in comparison with national library standards. Since, however, the management engineer has not specialized in libraries and so few survey reports are available,[7] evaluation even in terms of standards could be only impressionistic and interpretive. Moreover, even recommendations on internal management problems by experienced librarian surveyors can be judged better by local authorities than by persons not familiar with the survey directives.[8] In another decade this situation should no longer exist, and the literature on the subject should be more complete.

The management engineer is defined as a professional with varied experience, trained in one or more of the social sciences, particularly business administration, and having expert knowledge of one or more management specialties. A working knowledge of modern office and industrial machines of all kinds and makes, their availability and adaptations, is an essential part of his make-up. He may be employed in the administrative branch of an institutional, business, or governmental organization, or he may be in business solely for the pursuit of his profession, offering his services to various commercial and institutional undertakings and predicating his worth directly upon his ability to analyze in the scientific sense. In time he may specialize in one business field or enterprise. He counsels in the art of management, which is both the executing and the control of a given policy as contrasted

with administration, or the formulation and determination of policy. He is sensitive to a code of ethics which his professional society, the Association of Consulting Management Engineers, has developed.[9] He labors within strict limitations and his purpose is "to develop a *solution* to a *well-defined* management problem." [10] The solution must be workable, salable, and timely.

These limiting considerations "emphasize the fact that the management analyst must search out, not the ideal solution but rather the solution most suitable for a particular client at a particular time. Thus, the first basic skill required of the management analyst is the ability to *judge* which of the alternative solutions he can devise as most *workable, salable,* and *timely* in a given situation." [10, 11] He offers in addition the staff, equipment, and know-how of systems installation to activate his recommendations after approval by the consultee. In effect, the management engineer's specialization is a division of labor resulting from the growth of business units and "from fundamental changes in the economic and political environment of business." [12]

The survey concepts associated with sociological study and the organizational theories of political science are basic to the postwar management engineer's approach to the solution of institutional problems, but divorced from it. Political science long has advanced theory for the structure of government at the city, county, state, and federal levels, but has not isolated libraries, nor educational institutions such as universities, from over-all concepts and similarly hypothesized organizational theory. Early survey recommendations by management firms on state library agencies, for example, point toward better and more efficient organization, but do not take into consideration the nature and purposes of the units to be consolidated.[13-15] Later studies [16, 17] show the tendency to assume governmental organizational structure and administrative policy statements, and to concentrate on internal management to achieve goals of efficiency and economy. In these terms a brief comparison with the library survey as conducted by librarians is helpful.

The library survey developed out of the community-survey concepts of the sociologist, and became popular because of the rapid growth of libraries in the beginning of the twentieth century and the resultant problems, including those due to increased costs, and the fact that librarians were being asked to justify their libraries in relation to changes in educational, social and cultural patterns.[18] The survey method employed most frequently by librarians has been

that of comparison. Standardization is a cardinal principle of bibliog-
raphy, upon which rests the structure of the book collections and
services of libraries. Standards promulgated both in national and inter-
national book and documentary activities, therefore, serve as the
primary norm. Comparison "has taken various forms: (1) the present
condition of the library is compared with its condition in preceding
years; (2) the library is compared with other aspects of the university;
(3) it is compared with libraries of similar institutions; and (4) it is
compared with external standards, some of which have been devised
by methods which may be questioned." [19]

According to G. R. Lyle, who writes in relation to college libraries,
"The immediate purpose of evaluation is to provide a careful, critical
analysis of the condition of a library in a particular college. Such an
evaluation accomplishes three things: (1) it provides the necessary
information for formulating a program of future development of li-
brary resources and services coordinated with the aims of instruction;
(2) it serves to stimulate faculty participation in the development and
use of the library; and (3) it furnishes the data for interpreting library
services and thereby provides a basis for increased library support." [20]
And a publication of the American Library Association states: "A
survey of a library by one or more experience library surveyors is an
accepted method of checking up on the extent and quality of service,
of planning a program for the future, of setting up immediate or
long-time objectives, and informing and interesting the community in
the library." [21] It seems clear that the emphasis in the librarian's
survey has been on administration and not management—on evalua-
tion in comparatives leading to long-range policy, programing, and
planning.

Since librarians have not had much experience with the manage-
ment counseling profession it is necessary to examine the question,
why use professional consultants? But as the universality of manage-
ment suggests, the situations in business experience shown as the
causes for the engagement of outside consultants are directly com-
parable to library management activity.[22-24]

Management pervades nearly every human activity. There is, for ex-
ample, management in the fields of industry, government, education,
religion, agriculture, and charity. Few escape the influence of man-
agement, since either they are managers or they are being managed.
Usually the concept of management is thought of as applying to a
group, but the term also applies to an individual. Everyone perform-

ing a task alone or for himself utilizes at least a modicum of discretion and responsibility, and a voluntary urge toward achieving the desired end. Management is essential to most meaningful efforts and achievements.

Erroneously, and all to frequently, management is viewed as an activity existing only in a factory. This belief is due to the fact that the study and application of management . . . started in the factory and applied to the efforts of producing or manufacturing various goods. However, the fundamentals and techniques of management are applicable to all types of activities, including that of sales, merchandising, finance, transportation, real estate, government, school, farm, armed forces, and the operation of a household.[25]

Six situations have been identified as typical causes for the employment of a management engineer, and a decision to use a consultant is apt to be based upon a combination of these rather than upon any one. The six are: (1) "Management does not have the time and/or the staff to do the job." (2) "Management has tried to solve the problem and failed." (3) "Management requires outside assistance for political or organizational reasons." (4) "Management wants a 'fresh look' by an outsider." (5) "Management is confronted by a problem with which it is not familiar." (6) "Management wants information not normally available in the business. . . ."[26]

Translated into terms of library management it may be assumed that a combination of situations numbers 1, 2, 4, and 6 led the New York Public Library a few years back to engage the consulting firm of Cresap, McCormick, and Paget to study the acquisition functions of its Reference and Circulation departments[27] and the preparation functions of its Reference Department.[28] The letter of agreement on the study of preparations procedures, dated January 3, 1951, states the objective of the study as below:

. . . *Three principal objectives* were specified:

First, more expeditious handling—so that new acquisitions will reach the shelves, and cards will reach the official and public catalogs in a minimum of elapsed time.

Second, lower processing costs—to be achieved by a maximum rate of sustained output by all members of the staff who participate in preparation activities.

Third, the highest practicable level of accuracy and consistency to assure correct cataloging, and minimize misfiling of cards, misplacement of books, and similar errors.

These objectives stressed adequacy of service to users of the collections as well as economy in the performance of the preparation tasks.[29]

The same firm's letter of proposal, dated March 3, 1950, describes the specifications for the procurement functions as follows:

1. *The purpose of the study* is to "make recommendations that will contribute to more efficient operation, both with respect to the commercial phases of purchasing and to internal operating costs." To this end a careful study has been made of organization, procedures, and personnel.

2. *The content of the procurement* function is defined as embracing "the work relating to requisitioning, purchasing, receipt and distribution of materials and to accounts payable." The term procurement likewise includes the "receipt of material as a result of gift, purchase or exchange . . . and the disposal of gifts not required in the Library's collection." [30, 31]

A well-defined management problem as a part of the contract with the consulting firm is essential. The objectives and scope of the proposal should be clearly and succinctly outlined, and its limitations set forth, in pre-planning conference with the management engineer, and the method of study should be described. An estimate of cost should be included in the agreement, as well as a statement of possible benefits.

Success in counseling is vitally dependent upon complete cooperation and the availability of all pertinent information to the consulting firm. All responsible officers of the business or institution should be fully informed as to the purpose and scope of the study and should participate in pre-planning. Thorough discussion of the problem by all interested parties, and substantial agreement that a problem exists and a consultant should be called in, constitutes pre-planning.[32] Cooperation is thus assured, and the time required of the consultant is reduced. The lack of usefulness in certain investigations in libraries made by management engineers, aside from that due to the confidential nature of the inquiries as noted before, has been the failure of the contracting officials to observe these prerequisites. Contrariwise the success of the study of the preparations functions of the New York Public Library, as Robert E. Kingery states, "represent[s] an unusual degree of collaboration between the survey staff of Cresap, McCormick and Paget and the members of the Reference Department most directly concerned with preparation functions, and are, in large measure,

the product of joint analysis and discussion. Therefore, it is not surprising that seventy of the recommendations have, with minor adjustments, been either fully implemented or are in process of being carried out." [33]

Progress reports, oral or written, should be requested of the management engineer at regular intervals, and a firm date should be established for the study's completion. Before acceptance of the final written report, an over-all oral statement should be required to supplement and set the stage for the specific recommendations for improvement. The report should contain suggested procedures, forms, and flow charts, and observations on problems of implementation. Systems installation should be an integral part only if contracted for in the pre-planning stage. Surveys usually do not extend to this step.[34]

The management engineer should be responsible to an individual executive and in turn the executive should be held responsible for the consultant's activity. Staff should be furnished to the consultant if the need is foreseen in pre-planning conference. The following quotation testifies that success or failure of a management study by an outsider is finally dependent upon the attitude with which the administrator or administration agrees to consultation:

The key to the attitude of managements that have had successful consulting contacts seems to be in their *real acceptance* of certain troublesome conditions inherent in the use of consultants. If the executives understand that those conditions exist and are willing and able to accept them, an attitude results which is conducive to a successful consulting assignment.

We believe that management must accept the following three troublesome conditions before a successful consulting contact can develop: 1. The use of a consultant involves extra demands on executive time and management must be willing and able to give that extra time. . . . 2. Management must understand that a certain amount of time is required between the assignment of the problem and the fruition of results. Management must be willing and able to stand this time lapse. . . . 3. Management must be willing and able to create an atmosphere of cooperation.[35]

The selection of the right management engineer or consulting firm is also essential to a satisfactory job. A first decision should be on the type of consultant desired, based upon the nature of the problem to be offered to an outsider for solution. Whether to select a generalist or a specialist is debatable. Since there are librarians who seek consulting

assignments, though ordinarily without training in modern management methods, the library may benefit more from the work of the generalist. The selection of such an authority is consonant with a need to seek assistance outside of the library profession for political or organizational reasons, and for a fresh look by an outsider. If the consulting firm has specialists on its staff, as many do, or if the concern is willing to call in librarians as advisers to assist in the study, then the generalist should be a sound choice.

The management engineering profession has developed criteria for the acceptance of consulting assignments. The firm should decide, after preliminary discussion of the problem, whether it is competent to undertake the work and whether it has a qualified senior analyst to put in charge of the job. A reliable concern often will decline proposals and recommend other management engineers more qualified for a particular investigation. The administrator should examine reports of completed studies by the companies he is considering, and should seek the opinions and experience of others about the firms. Further, he should secure estimates of the cost of the work and ascertain the firms' reputations both financially and professionally. Finally, he should interview personally the management analyst to be assigned to the job. His decision here should be made just as if he were considering the person for a permanent position in his organization.

Most important is the administrator's judgment of the ability of the proposed analyst to work with his staff and to elicit its respect and cooperation. D. P. Hess has said: "Before retaining any consultant, I would want to make very sure that in addition to adequate technical knowledge, he had a maturity and personal qualifications to be able to contribute to the further development of the executives in my organization with whom he would be working. After all, the consultant's primary function is to advise and assist. It is up to us in management to make the decisions and direct our organization in achieving our objectives."[36] These criteria cannot guarantee selection of the best consulting firm for a given problem, but they are useful safeguards in assisting the administrator to make an intelligent decision.

The engagement of consultants by libraries is commonly considered too costly. Many librarians believe they cannot afford or justify the expense or long-range budgetary planning which is necessary to obtain the required sum. For the average library this is probably true; although if the librarian lacks the time or staff or both to do the job and he and his staff have not been successful in solving the problem,

a consultant may offer an economical means to solution. Joel Dean asserts: "Notwithstanding the fact that very large concerns often make extensive use of outside advice, there are grounds for believing that for such companies counsel should be restricted only to highly specialized studies. In general, the concerns that seem to benefit most from such services are the medium-sized and small companies." [37]

This conclusion can be justified for libraries further since (1) the typical library management problem is not likely to recur with regular and short-term frequency, (2) the library does not ordinarily employ personnel qualified to do the job, and (3) if staff is available it may be difficult to concentrate the time necessary to a prompt solution, since other matters of a professional nature may necessitate transfer of the staff to another assignment. Direct savings or, more important, improvements in internal management which will produce greater value for dollars expended, are sufficient to justify outlay for a study by a management engineer.

The cost of using a consultant is summarized by A. H. Dunn:

Three methods of payment are used: per diem, lump-sum and retainer.

The per diem fee, the most commonly used basis, ranges from $50 to $150 per day per man (occasionally higher) depending upon the experience and reputation of the individual and the firm of which he is a member. When per diem is used the total cost of the assignment depends upon the number of men used and the length of time spent on the job. A few of the consulting assignments studied were performed by a single member of the consulting firm, while the bulk of the cases involved two or more members. In most cases it is not possible to foretell the precise number of days required to complete an assignment.

The study found the lump-sum method of payment to be most typical for an exploratory study by the consultant to ascertain the nature and scope of the problem under consideration. These surveys were usually of short duration, sometimes only two or three days, and therefore the cost ran only to a few hundred dollars. However, some exploratory surveys were found whose cost was as high as $10,000.

A consultant's retainer fee runs in the neighborhood of $150 to $250 per month (and occasionally higher) and is employed by those companies desiring a continuing relationship with their consultant. This method of payment is the same as that used by many companies to remunerate their legal counsel.[38]

These fees are not inconsistent with those paid to librarian consultants.

Benefits to be derived from association in management analysis with the management engineer are both direct and indirect, actual and implied. The chief of the Preparations Division of the New York Public Library reports, referring to the study in that library:

It is, of course, too early to tell what the final results of the survey and its recommendations will be. However, it is already clear that the first two of the three principal objects [sic] of the survey will be achieved. During the fiscal year 1951–52, the division cataloged 90,736 titles as compared with 76,341 for the previous fiscal year. It is expected that we will handle 150,000 titles during the fiscal year just beginning, without any increase in staff. The elapsed time between the receipt of the material in the Division and the filing of all cards for that material in the catalogs has been substantially reduced so that one month is the average for the material received in bound form.

Important as these results are, the "human" ones are undoubtedly more important and more enduring. Because of the close team work among the survey staff and the division staff, we now feel our problems can be solved, and that the day is not far distant when, without arrearages, we can enter phase five, "long-range action." [33]

From the Acquisition Division of the New York Public Library, the chief wrote:

Of the 41 recommendations made in the Survey for the Acquisition Division, 19 were put into effect in full and 12 in part. Four others were tried and given up. The responsibility for one activity was shifted from the Division. Five are still under consideration. All in all, a total of 41.

The Survey has enabled us to increase production and has been a source of many new ideas. From its groundwork, a continuing process of self-examination has been going on and phases of our work have further changed in ways not contemplated by the Survey.[39]

The analytical ability and skill, the objectivity of the approach, the varied experience and the independence and impartiality of the management engineer, together with effective presentation, can lead to solution of problems in chain reaction and often in different directions.

Dealing with the presentation of results, Dean says:

Because of his experience in systematizing information and his practice in writing reports, the consultant usually develops a facility for presenting his findings and conclusions forcefully and clearly. This is

a significant ability, for sometimes an orderly, logical, and clear presentation of information already in the possession of the management aids materially in solving a problem. On other occasions an integrated word-picture of a firm's entire operations provides the management with an over-all view difficult to obtain in the course of routine administration. Furthermore, a forceful presentation of the findings frequently leads the management to decide and act on matters over which it had long been procrastinating. Thus a clear presentation often sharpens the issues, aids in a balanced comprehension of the entire organization, and facilitates decision and action upon the consultant's recommendations.[40]

A good example of these benefits is the recently completed study of growth in research libraries in the northeast. The problem assigned to the consulting firm employed "to conduct a preliminary review of the problem and its recent history, as the basis for analyzing the complex issues involved and developing proposals for . . . consideration" [41] was stated in part as follows: "The increasing volume and variety of publication, the growth of research collections, and the constantly growing demand for reference material have made present library facilities inadequate. Library buildings cannot house the books that are needed, nor contain the readers who wish to consult them. Diminishing incomes make it increasingly difficult to acquire needed materials and to provide adequate staffs, and practically eliminate the possibility of building additional facilities for the various libraries involved." [42] "The problem is aptly described as one of 'vastness, complexity and growing intensity.'" [42]

The objectives of the review were four: "1. To examine briefly past efforts to meet this problem . . . 2. To retrace the discussions and deliberations of key officials of libraries in the northeast during recent years . . . 3. To identify the issues which led to the appointment of the Trustees' Committee . . . 4. To outline for the committee an approach through which action can be initiated on immediate and long-range problems. . . ." [43]

The study, which was conducted in October 1952, concerned four major research libraries in the northeast—Harvard, Yale, Columbia, and New York Public Library—and led to a new statement of policy and accelerated administrative action in one. To develop and to implement the new policy a management research assistant [44] was added to the library staff. The recommendations of the consultants briefly were: "A two-phase approach should be applied to bring immediate

relief and to lay the foundation for long-term relief. Phase I—Self-Solution: Comprising those steps which can be taken now by each Institution without resort to collective action. Phase II—Collective Solutions: Comprising those steps which require collective agreement and action to compress the space occupied by little-used [or limited-audience] research materials, and to reduce the *rate* of growth in individual libraries." [45]

The administrative head of one institution remarked: "As librarians, of course we know about these problems and proposals. They have been widely discussed but the discussions have not been implemented by serious studies or action. We believe that Phase One is a program that each individual library organization can and should carry out for itself and that it would be less costly if undertaken in this way." [46] As to Phase II, "I believe this is where we librarians need help. May I mention . . . that the 'core' of the problem is university-wide cooperation." [46]

This comment was followed immediately by proposals affecting the immediate future of the library in question, addressed to the university administration. They included detailed plans and costs for the installation of new stacks in compact storage arrangement, an accelerated microtext program, and the establishment of a staff charged with the selective retirement of little-used materials from the stack collections through outright disposal, the substitution of microtext for volumes, and transfer to the library's storage collections. It was estimated that through these steps the library's growth problem would be solved for at least twenty years, and possibly longer. In summary, it was stated: "What is recommended above constitutes a recognition of a new policy for the libraries . . .: selective, instead of all-embracing; selective acquisition and selective retention or storage." [47, 48]

Other collateral benefits from the work of the management engineer may be derived from (1) his ability to get at the major cause of a problem; (2) the extent of his research to test alternative hypotheses based on scientific methodolology; (3) the stimulation of personnel in the organization studied to seek solutions to their own difficulties; (4) the development of standards or comparisons previously non-existent; and (5) the "installation of modern management techniques. . . . Frequently the manager is too occupied with routine administrative duties to read or visit extensively enough to keep abreast of new developments. Thus it is the function of the management engineer to know these new developments and to serve as a connecting link be-

tween the generalized research of the universities and its application to scientific business problems." [49]

As the librarian faces the growing complexities of modern book and documentary problems, coupled with his professional aim of evaluating library services through the success enjoyed by library patrons in accomplishing their purposes, it would appear he can benefit from the scientific thinking and methods of the management engineer. Modern management concepts of executive development, psychological counseling, resistance to change, communication, planning and control, employee participation in management, systems or operations research, statistical controls, compensation, training, work measurement, and the trend to put the word "man" back into the word management [50]—all are at the command of the management engineer. While firms of management engineers have had little experience with libraries, and while intensive methods and procedures analysis, systems management, and the scientific methodology used in business, have not been easily applied in all library situations, the over-all objectives in business and library administration are similar. An acceptance of this likeness, a knowledge of the limitations of the management counseling profession, and a willingness to use the management engineer should be of considerable aid to the library administrator in planning the library of the future.[51]

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