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Project management: the case for a code of practice

M. SNOWDON

Mr Snowdon

The background to this Paper is that, whilst technical achievement is generally of a very high standard, the overall effectiveness of capital investment in engineering works leaves much to be desired. This statement can be substantiated by data which have been published. It is however a situation which can be improved and the Paper suggests one step in the improvement process.

33. One problem is that management is not seen in positive terms. After all it is really a question of the ability to control events. Unfortunately there are deliberate misuses of the term 'management'. Detailed programmes based on computer print-outs or detailed statistical information on what has been spent confer an aura of respectability to the 'management' team. Too frequently however the mass of paperwork produced inhibits positive control.

34. The requirements for good management are not basically different from the requirements of the engineering profession. This is the main reason why the ICE should take the lead in ensuring that a code of practice is formulated.

35. Historically engineers have demonstrated their ability by high standards of performance. This in turn led them to be entrusted with further work for which their training and experience has made them suitable. The situation with regard to project management is similar. There must be some base line of understanding of management philosophy, knowledge of the reasons why positive control is necessary and greater appreciation of what provides control. A code of practice would surely help in providing these essentials.

The Chairman (Professor G. Trimble)

I believe that Mr Snowdon has made a good case for improvement of project management, but I do think there are a considerable number of problems in trying to codify the process.

37. I have noted three. The first is that projects are extremely diverse. A project may be in petro-chemicals, but it may also be the introduction of a new governmental procedure, or the development of a new device; an electro-mechanical device for controlling underground trains is an example. It may be the introduction of a new product; such a project is partly technical and partly administrative.

38. The second point is that while quite a lot is known about project management information systems, very little is known about managers' reactions to the information that they receive from these systems. The effectiveness of any system depends crucially on the way it stimulates management action. Until much more is known about managers' reactions, codification could be damaging.

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39. Lastly, I believe there is a lot of evidence to suggest that the best systems are the ones devised by the people whose actions have to be controlled. If the person responsible for a project devises his own system, he will respond to the system and make sure that it works. So there are almost as many systems as there are project managers, codification could be very limiting.

Dr C. R. Robinson, Peat, Marwick, Mitchell & Co.

The frequency with which the term 'project management' is used in the engineering world suggests that any discussion on a code of practice must be too broad to be of value. The Author has, however, specified the field he is considering and his limits encourage one to investigate his proposals largely from a client's point of view.

41. True project management, rather than the more specialized field of construction management, encompasses a very wide field where the pure civil engineering content must be viewed in perspective. To obtain full value for money, an assessment of the relative importance to the client of each phase of a scheme must be made.

42. For complete control the project to be managed should start from feasibility study and proceed right through to commissioning, be it a hotel, bridge, office relocation, early retirement scheme or new port. Considering that the feasibility study can include the stages of concept design, market study, financial analysis, legal implications, location, staff and labour, and impact on the organization, the complexity of attempting an all-embracing code can be imagined.

43. It is essential, therefore, to bear this complexity in mind and ask the question 'Is there a sufficient case to be made for using expensive man-hours to produce a code of practice on project management?' Should it be concluded that the answer is that such effort is justified, the obvious second question is 'If a code of practice were to be prepared, who would use it and what benefits would accrue to the user and his client?'

44. There are in principle two types of code of practice, the design codes such as those used for structural steel, prestressed concrete or industrial noise exposure, and the general codes setting out broad principles such as those on industrial relations and the British Institute of Management's 'Code of Best Practice for Managers'. A project management document could only be of the second type owing to the breadth of the subject and the consequent inability to draw up specific guidelines.

45. There are two major skills involved in project management. One is the design, installation and operation of systems for control and information. The other is simply management itself. Looking at the project again from the client's viewpoint, although he will often have management skill available, he is unlikely to be able to exercise a sufficiently high degree of skill at systems for what is likely to be a one-off job. Furthermore, my experience has been that many clients do not wish, or feel unable, to provide the managerial time required to effectively supervise the project.

46. Taking the Author's analysis of a possible scope for a code as set out in § 29, it is clear that all but two of the eight potential sections are covered by standard management thinking. They are summarized by key words such as: objectives; target setting; planning; resourcing; selecting; organizing; controlling; motivating; delegating; and communicating. An adequate code of practice under these headings will be found in any good management textbook.

47. The two sections omitted are, of course, a review of available techniques, and dealing with industrial relations. The latter is already covered by a code and, as there seems no point in duplicating those guidelines, I will not consider it further.

48. One returns, then, to the one item which would seem to benefit from a code, and that is techniques. Under this heading networking, bar charts, cost-benefit analyses, cash flow and internal rate of return are more than adequately covered in existing publications. Not so strong perhaps are techniques to be used for multi-discipline, long-term cost planning and control, activity analysis and control, and reporting only the necessary information to the correct person. Perhaps there is also need for in-

formation on the most suitable manual or computer techniques to be employed for a given project so as to produce the optimum on the effort/effect balance.

49. Other aspects which might be considered are the updating of plans, the subsequent working to them and the difficult consideration of when to accommodate changes and when to ignore them. There is also the aspect of setting up an initial plan of sufficient flexibility to accommodate subsequent changes.

50. It is surely in the field of complex planning and updating, control techniques and the management of change in which a techniques manual rather than a code of practice, would be of value. It would itself need regular reviewing and updating and should be aimed at all the major engineering disciplines. Copies could even be distributed to architects!

51. To answer the initial question 'Is there a sufficient case to be made for using expensive man-hours to produce a code of practice on project management', I have to say that there is not. Many important current problems are indeed highlighted by the Author, but it is too great a step to conclude that a code would be able to solve them. The aim must be to improve the quality of the management of projects and this could benefit from a frequently updated study of available techniques.

52. In conclusion I would restate the view that better project management will come largely from the improvement of the management skills that are used. The way to do this is by reading around the subject, thinking about what one is doing, discussing with others having a different field of problems and, as I am frequently reminded, by experience.

Mr P. T. Pearce, Cementation Projects Ltd

Project management is an intensely practical matter in operation but a very difficult and nebulous matter to deal with in theory, and its principles are difficult to express. I read the Paper with great interest and agree wholeheartedly with individual sentences and paragraphs. But having read the Paper a number of times, I cannot see that the Author has made a clear case that there would be benefit from the preparation of a code of practice.

54. If there were a code of practice, it would be important that it dealt with fundamentals which were beyond dispute, which would give practitioners of project management a deeper insight into the objectives that they were trying to achieve, rather than deal with specific techniques which might go out of fashion or might not be relevant to certain types of project, or might indeed simply not be preferred by individual practitioners or organizations. In my opinion, if there were a code it would be essential that it should deal with common ground that would be of value in standardizing the approach to the problem.

55. I would view these very simple principles on which one should concentrate as being in two areas. In terms of the objectives, which the manager has to achieve in the project, these fall naturally into three sectors: quality, cost and time. Time is quite clear. The whole set-up of any project has time factors in it—relations with other activities and ultimate completion date, times which must be achieved in order to meet financial objectives. Cost is fairly clear. In either commercial or social terms, project cost is determined at the beginning and must be held to; decisions taken in the course of the project must be taken in the light of their cost implications and warnings given of adjustments that need to be made. Quality covers all the physical aspects of the project, not only quality in the narrow sense but in all its physical aspects.

56. These three objectives have to be followed through the project, and whatever techniques one uses and whatever sort of project it is, there are almost without exception six phases through which it passes: an analysis at the beginning, which one might call study; the brief, or definition of what the project is about; design, which is some sort of technical activity which converts the idea into something which can be implemented; procurement, which means bringing together the means of achieving the project, and

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the materials for it; construction which may be construction or manufacture but is the physical assembly of the thing; and finally commissioning, which is putting it to work.

57. So there are three sets of objectives—quality, cost and time—and six stages—study, brief, design, procurement, construction and commissioning. If one uses those parameters as the basis for thinking about project management, one can clarify one's thoughts very readily.

58. As with many documents prepared for explanatory purposes or to give people a guide as to how to undertake certain activities, and with many codes of practice and certainly with many documents prepared by a committee, there is a grave danger of falling into a trap of being right in detail but wrong in principle and therefore being relatively ineffective.

Mr W. P. Winston, Consultant

I am in the oil industry and I work as a consultant.

60. In § 1 the Author defines project management, but appears to exclude surveys and feasibility studies. I think that is appropriate, but the Author also suggests that management is not only a matter of controlling and decision taking. In management there is an element of planning and devising courses of action. Hence I suggest that to the Author's definition might be added 'management implies an element of creative work'.

61. In § 3 the Author sets out dominant pressures on management, which affect management techniques. The main pressure set out is financial. I suggest there can be other pressures. For example on government projects there may be no interest as a direct charge to the project cost, but, pressures can be very real and could be defined as urgent need. Some of the early motorways in the UK were very urgently required to relieve traffic congestion, and there was great pressure to get them designed and completed.

62. In § 15 Mr Snowdon refers to codes of practice. I find sometimes that there are no codes of practice. In one instance I met recently the code of practice set out principles only. This was a technical code, not a general code, and it was necessary to work out with the authorities the particular code applicable to the project. This is, I suggest, a management task which sometimes turns up.

63. I find in practice that people, particularly professional people, look on the stages set out in Fig. 1 as steps, and take the view that each step must be firm before one moves to the next one. In North Sea oil work the time between a field being confirmed and production starting may be less than 4 years. Considering what is involved, that is very fast working; some overlap between stages is inevitable and quite normal, and management must be able to work efficiently in such a situation. I suggest that there are various techniques for achieving this. One is that the project must be adequately staffed, and the other is that the technical design, the planning and lay-out, should be reasonably loose in the first instance.

64. Figure 1 also illustrates management tasks. In civil engineering it is usual to think that there are just three parties: the employer, the engineer and the contractor. In practice, the nature of a project or its location, or commercial and economic considerations may cause other forms of organization to be adopted. For instance, the employer's staff may be engineers; or an employer may seek a turnkey contract; or a task force may be organized; or the employer may exercise very close management control and undertake procurement in conjunction with the engineer. These are just some of the variations in use. I suggest these forms of organization are established and hence a code of practice for project management would need to be very flexible. It would not be acceptable to impose on employers any particular form of organization. On the other hand, these forms of organization may affect professional responsibility and liability. If the task force is used, a specialist engineer may find that he undertakes design but does not supervise the construction contract. This will probably have to

be accepted, but a code of practice for management could include safeguards. For instance, in the case just mentioned liability should perhaps be vested in the drawings and not on works as built.

Mr R. Rooley, Donald Smith, Seymour and Rooley

I am engaged principally in environmental engineering. Recently my firm had a lot of pressure put on it to form a separate organization within the group for project management. I think that my firm's background colours to a large extent how we approach this problem. When we design and construct buildings, we are very conscious that members in the design and those in the construction teams are of equal value and equal in work content. On the civil side and on the large industrial side this is not by any means the case, as the last speaker has touched upon. There is a risk of imagining that all problems are caused by other professions.

66. Project management covers a building from the moment when it is merely a gleam in the technical director's eye to the time that the demolition certificate is signed by the financial director. Occasionally engineers get themselves tied down to the small bit in the middle of designing and constructing. But all aspects of technology must be considered.

67. There are three levels to a code, the first being the ethics, the second a form of engagement, and the third a code of practice. The code of ethics and standards of performance are already satisfactorily set by the Institutions.

68. Regarding the form of engagement, there is, I think, a problem among project managers. Each practice has its own procedures and its own fee levels. It has stated what it will do. If project management is to become a viable subject—and there seems to be some need for it—there has to be some form of co-ordination.

69. The code of practice set out in the Paper develops the ethics, and the engagement, and it seems to me to set a combination of the minimum standard which is acceptable and the typical standard or path for the course.

70. The Author suggests that there should be an Institute of Project Managers. Project managers whom I have come across—and I am talking about individuals, who are there by selection—are ordinary people blessed with strength of character and with a sound knowledge of the whole of the building industry, usually based on one part of it. They are usually corporate members, or probably Fellows, of a professional Institution, and it is there that the standard must be set in basic training. Management cannot be taught to a person between 20 and 25 while at university. It must be taught a little bit later, and is learned a little bit later, probably around the time that a person moves from Membership to Fellowship.

71. There is, perhaps a need for some form of Association of Project Managers, possibly similar to ACE, with experienced members. Is there a need—I think this is what is being questioned—for such a group of men to get together and discuss the need for the codes at the three levels?

72. The basic qualifications, ethics and standards are set by Institutions, and it is there we should look for the source of manpower in the specific form of the industry. But there should be at least a working party to write the terms of engagement and code of practice, to investigate whether there should be one, or whether indeed there should be an Association of Project Managers. I think there is a need to test the market.

73. I would suggest the ICE invites those who see a need for an Association of Project Managers to attend a working party.

The Chairman

There is in fact an Institute of Project Management which is based largely in North America. There is also a group called INTERNET, which is operating largely in Continental Europe, and there is an affiliated group called INTERNET UK. All of these

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groups are concerned specifically with the management of projects, not specifically construction projects, but the management of projects generally.

Mr J. W. Rogers, Taylor Woodrow

As a contractor I could not disagree more with Mr Rooley. Since World War II there has been a proliferation of systems, data, titles right across the whole fields of architectural, civil, mechanical, electrical, instrumentation, chemical work, etc. The people mostly to blame for this are the management consultants. Everybody is getting on this band wagon, taking a little bit of the idea and developing it totally out of proportion. I personally am totally against an Institution of Project Managers. That is not to say that the subject is not worth talking about. An exchange of views is valuable, because that is the only way one gets forward at all.

76. Project management as a subject is the simplest of all. The object of project management is not what is given in the Paper, but simply to achieve the objectives set. I agree with Dr Robinson, but if I may add one thing to his list of how managers train themselves, the important thing is practice, not theory. A project manager needs a great deal of assistance from his colleagues and some from systems.

77. I do not think any case at all has been made out for a code or for standardization. In fact, on the contrary; I think the diversity of ways in which people manage is a great asset.

78. On points arising from the Paper, first of all, I should like to know to whom the code is directed and who is going to use it? That to my mind has not been made clear. That leads me on to the second point. At the beginning of the Paper it is stated '... there are many demands from different quarters to formalize ... activity'. I would very much like to know what quarters. Perhaps the Authors could give some information on that.

79. If a code were produced, one significant point has been omitted from the list of suggested headings, and that is the client. In all these activities there is no reference to a client. There must be a client unless it is only in-house project management which is considered, and I do not think most people have that in mind when they are talking of the subject. One area that is absolutely essential and where a great deal of effort is required is in the education of clients. Many clients have little idea of what project management is about or what can be achieved. It is vital when embarking on a major project that the client realizes he has a responsibility. He must produce those few key people who can interface with his managers, whoever they are, so that the project goes along, who can make decisions, agree courses of action, provide data and so on, supporting the manager. That is the first priority and ought to be at the top of the list. Without that, no project will go at all.

80. Mr Pearce mentioned six stages in a project. Perhaps I could tell him another definition of the six stages of a major project: first is enthusiasm; second, disenchantment; third, panic; fourth, search for the guilty; fifth, punishment of the innocent; sixth, decoration of all those who took no part.

Mr J. B. L. Faulkner, W. S. Atkins & Partners

The Paper is of great interest in that it points a way on how law and order might be brought to a difficult subject which is badly in need of it. Whether project management is considered as a discipline, a profession, a job or a concept, there are two main problems: a lack of definition, and the fact that everybody thinks he knows something about it.

82. Any proposal such as the Author's to overcome problems of this sort must deserve serious consideration, but on whether a code of practice is the right way to do it, I must join with the doubters. 'Code of practice' is an emotive phrase; it can be regarded as anything between a child's guide at one end of the spectrum and a rigid strait-jacket at the other. So it is definition, the way to define, that seems to be the problem.

83. Many firms of contractors and architect engineers have their own clearly laid down procedures for project management, and all the associated services, such as procurement, cost control and programming. These are generally presented as 'our project management system', always described as well tried and successful, but I am not quite sure how often they are used or if they really are successful. My organization has been tempted down the same path, but gave it up because each client is different. Many have their own ideas which they wish to see used on their projects, and as all projects are by definition unique and different, there can be no universal system.

84. What there must be is room for the individuality and experience of project managers and recognition of the uniqueness of each project and the increasing complexity of projects, particularly their multi-discipline aspects. It is the integration of these multi-disciplinary aspects which is causing the problems, and the lack of mutual understanding between those disciplines.

85. The basic tensions which are an essential part of any project must also be accepted. Time, cost and quality are all involved, but there are two further items which come into question, both of which produce tensions which affect the management of the project. There is the client/contractor relationship and human relations, both of which deserve greater attention. In running a project, all the different parties involved have different objectives, and the project manager has to maintain the correct balance between all of them.

86. The personal touch is essential, and the whole subject must be kept as simple as possible. That is why I am a little frightened of a code; it is so very impersonal. Project management is difficult enough without being overloaded by unreliable and inefficient management systems or detailed codes. There is just one question which has to be continually asked through the course of a project. At any point in time does the project as a whole, and do the people who are involved in it, know where they are going and how they are going to get there?

87. I agree with Mr Snowdon that it would be useful to have some standards of performance. The NEDC mechanical and electrical working party report made the same recommendation, together with many other frightening conclusions on the state of the construction industry. Mr Snowdon has given in § 29 his ideas of what should be examined, but there is also a need to determine methods and priority.

88. I would suggest that, stemming from the three Cs of project management, control, co-ordination and communication, a joint working party set up by the major engineering Institutions could produce, not a code, but a guide to good practice. It will have to define the subject; define the stages; define the terms used, e.g. is it programming, or planning? What is included in contracts and procurement? What does cost control mean? What does commitment mean? (There are five or six different definitions of commitment.)

89. It has also to establish and define the criteria which management needs in order to run the job, so that each appropriate level of management obtains all the information that it requires—but no more. This means involving them in deciding what the system should produce.

90. Training and selection of project managers also needs review. There should be some identification of subjects for further development; and in particular human relations, team building and the measurement and recording of output and productivity.

91. Production of a guide to good practice on these lines, incorporating the experience and knowledge available but avoiding the rigidity of a code, would in my view be a useful exercise.

Mr P. A. Cox, Rendel Palmer and Tritton

If there were to be a code of practice, its main use would be in gaining acceptance of project management as a service which is needed in industry, and this would be of considerable benefit in the UK. I think that, on the whole, whilst in large industry project

management is an accepted technique, it is not nearly so readily accepted in the public sector. A considerable part of UK expenditure is in the public sector.

93. If there were a code of practice, one would need to see whether it was to be designed for the practitioners, or for clients, so that they can understand what project management is. The various points which have to be covered by project management might be defined. Particularly in the educational stage of talking to clients the degree of freedom in taking decisions or in identifying points where decisions have to be taken must be defined. I think it is here that many of the problems occur when projects are being organized. Nobody has decided what decisions have to be taken at what stage, and I think a code can assist in doing this.

94. A code might also bring to the client's notice the fact that a team has to be set up comprising both his own people and frequently outside consultants. Such a code would enable a client to accept more readily that many decisions which he would want to keep to himself might have to be partly delegated to an outside organization if the project were to be completed on time and to the agreed cost.

95. In defining what had to be included in the code, I would disagree with Dr Robinson who thought that it should cover techniques. I believe that techniques ought not to be in such a code but that it should deal more generally with the overall concepts which have to be followed in operating project management.

Mr H. A. G. Tattersill, Consultant

I wish to bring forward two points in respect of project management which have a bearing on the suggestion of a code of practice for this function.

97. My first observation has some bearing on Mr Snowden's §§ 3, 5, 7 and 8. The employment of a project manager identified professionally as such is of variable value. If his background experience has blended design and construction in parallel with appreciation and balance of the elements of time, cost and quality, then there is the chance of a high degree of success. However, the economic and technological climate of the past few decades has of necessity produced architects and engineers sensitive to the time and cost aspects of a decision which may primarily be one of design and construction, or both combined.

98. If an architect or engineer falls short in these considerations then I suggest that by current needs and standards he is not the best of professional men. On the other hand if his appreciation thereof is adequately developed then he can be a good project manager, his finer sense of quality being properly blended with time and cost aspects. Incidentally, I do not consider that appreciation of cost involves total reliance on a quantity surveyor. A QS has a wide knowledge of current rates quoted by contractors for various items, but not always an appreciation of the labour content thereof; this element often has a vital bearing on a design decision.

99. The question of high interest rates on borrowed capital is primarily one of economics and mathematics; again a properly trained architect or engineer ought to be taking this in his stride.

100. The only remaining issue, particularly in a multi-disciplinary project, is the right choice of professional man for the project on hand. Usually this boils down to the choice of an architect, civil, structural or mechanical/electrical engineer, according to the discipline which dominates the project, not necessarily by cost or volume, of course.

101. My second observation relates to problems created by the client employing a project manager on his own staff, and often coupled with the fact that the client is installing his own plant or equipment in the project and even purchasing it himself. This arrangement is becoming prevalent from a matchbox factory or pharmaceutical laboratory to a paper mill, steelworks or power station, with varying degrees of success.

102. This can result in the following possibilities:

- (a) The client's activities become an integral part of the overall undertaking and must be so recognized. In this case he and his project manager must accept

discipline imposed by the budget and programme, or the responsibility for its breakdown should he elect not to do so.

- (b) The consulting engineer appointed for the design of the project (in which the client's equipment is only one element), can be frustrated by the dominating power of the client's project manager and by the fact that the said manager stands between the client and the consultant.

In short, who is the boss? I rather doubt if a code of practice could successfully cover this contingency. However it is becoming more dominant in these days when a major proportion of projects are for public bodies and nationalized industries.

Mr B. G. Ingles, *Property Services Agency, Department of the Environment*

I should like to make it clear initially that the views expressed here are my own and not necessarily those of the Department. Much of good common sense is expressed in the Paper and it is hoped that the rather indefinite proposals made therein can be polarized rather more effectively in subsequent discussion. The professional Institutions certainly have an important role to play in this respect.

104. Two aspects of project management need to be considered:

- (a) the personal performance of the manager himself
- (b) the supportive actions of his superiors, peers and subordinates.

The first is how the individual develops in his career from being a designer ('technically professional') to becoming a manager ('managerially responsible' with a constructional background) and the second is concerned more with overall resource planning, communications and personal relations. Perhaps the necessary arguments can be developed by following the appropriate sections in § 29 of the Paper.

105. A manager certainly needs to know the full extent and nature of his project as well as identify the principal management tasks which are associated with it; whether he could identify one set of characteristics from a series set out in any publication, called a code of practice or not, is open to question: does it matter?

106. Performance criteria will be more difficult to establish, bearing in mind that an assessment of success depends on:

- (a) the degree of client satisfaction of the completed project: does it perform the functions intended (physical) and does it give the rate of return required by the client as the result of his investment (financial)?
- (b) the extent to which the project was constructed within the budget and time laid down by the client; in the case of the non-technical client, this could well amount to whether the project manager had kept within financial and time restraints which he himself had established at the outset; there is of course a direct relationship with (a).

107. Responsibilities involved in project activity certainly need to be identified, and in the case of multi-professional design stage working, a clear statement needs to be made of the detailed function of an inter-relationship between each profession and discipline.

108. In many cases, the manager is in a position where he has to utilize the staff provided for him and he has as a result to develop his capabilities of man management (see § 112) by identifying and building on the strengths of those staff to obtain maximum performance. If however, high quality staff can be recruited or added to his complement at short notice, then the essentials of resource planning need to be applied to the full so that, ideally, the capabilities and skills of staff can be fully matched to the task to be performed. But how often does this ideal situation obtain?

109. A statement of available techniques and reviewed criteria are an essential need of the project manager so that he can select both from the written word and by means of unbiased verbal advice the most appropriate procedures and systems.

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110. It follows from this therefore that a firm base for communications and the establishment of a high standard of information flow from 'systems experts' to manager, from manager to the design office and to the construction site etc, are also essential.

111. Project managers should be selected not from any one profession but on the basis of their previous proven ability to manage smaller projects; identification of capability is the first important factor and training will only be able to develop an awareness already inbuilt in the individual. It will not equip him to be a project manager when the potential is not already there, even though he may be a first class designer.

112. The same argument applies to man management; the individual must possess the ability to apply as appropriate any or all of the 'job enrichment', 'motivation' or similar concepts so popular today, but he does not gain experience merely by reading about them.

113. These arguments lead to the impression that a requirement exists for:

- (a) guidance to superiors on the selection of project managers, on overall resource planning and on the assessment of success criteria;
- (b) the availability to managers of professional and technical design criteria and information;
- (c) the availability to managers of critiques on established procedures and systems;
- (d) guidance to managers during the various stages of the project on the appropriate application of (b) and (c) and hints on the interaction between disciplines so essential to successful completion.

114. But can this all be brought together into a code of practice? And even if it could be so formalized, would not a rigidity of thought, of 'working to the book' and a failure to use valued judgement and initiative result? It is suggested that this indeed would be so and severe cramping of style result.

115. Nevertheless, it is worth considering whether the principle of a 'good old British compromise' could be applied. The Property Services Agency for example, issues a very successful in-house project management procedure guide, supplemented by design and procedure information and instructions which cover many of the requirements listed above; other large constructional organizations could (and no doubt do) issue similar documentation, each tailored to their own particular requirements. Is a more centrally prepared code of practice therefore needed? It may certainly be useful for smaller consultant firms as an overall document but the decision on this should be surely taken by the major professional Institutions.

Mr A. D. Austen

The Paper reviews succinctly the need for more efficient project management, the type of person the project manager should be, and the services required from project management. With the Author's definitions and argument there can be little quarrel although one might perhaps wonder how the building industry is to obtain '... protection from uncertainties ...' (*sic*). Where he fails to convince is by arguing that the trials and tribulations of project management will be reduced one iota by the introduction of a code of practice. Indeed, in at least one of his supporting arguments he makes the classic error of confusing cause with effect: that the various functional divisions of the construction sector, particularly those between 'design' and 'build', lead to inefficiency and have the *effect* of making project management difficult is well known. The remedy lies in tackling the *cause* of these divisions rather than tinkering with the mechanisms of project management.

117. The summation of the case for a code of practice in § 28 is so generalized as to merely amount to supporting the thesis that project management, like mother's milk, is a 'good thing'. It talks, for example, of a minimum norm of acceptability. Acceptable to whom? The financier? The client? The consultant? The architect? The contractor ...? Each of these is presumably striving to achieve optimization of

'value for money' and in the process conflict arises. To propose that a code of practice will help to harmonize the whole and achieve a total optimization is extremely optimistic. Furthermore, what are the geographic limitations of the code? Is it to apply only in the UK, the EEC, or universally? The inherent problems probably increase exponentially.

118. Finally, the foregoing notwithstanding, I whole-heartedly support action to improve the efficiency of project management, but I believe that this is more likely to be achieved by tackling some of the basic problems and by better training rather than by attempting to impose a code of practice.

Dr R. F. Legget, Consultant, Ottawa

In response to Mr Snowdon's plea (§ 30) for 'clarity as to what project management is', a definition well accepted in Canadian construction circles is that 'construction management is general contracting with all the risk taken out of it'. Since the 'project management' discussed in this Paper appears to be construction management, the views of the Author on this definition would be appreciated.

120. Accepting, naturally and without question, the validity of the Author's suggestion (§ 18) that 'the overall efficiency of the construction industry must improve', would the Author please explain how 'project management' can achieve greater efficiency than the use of well prepared independent designs and contract documents, a call for competitive tenders and the award of a contract to a well qualified general contractor whose work will be independently inspected? The Paper does not appear to include any evidence that gives warrant for the implicit suggestion that 'project management' is any more efficient, if indeed as efficient, as this well-tested consultant-contractor method of carrying out civil engineering construction.

Mr J. C. Thomson, Development International Trade Co.

The Paper highlights the almost total neglect by and ignorance of engineers on the subject of project management.

122. A brief survey of the literature emanating from other bodies such as the American Society of Civil Engineers, together with examination of the current state of the art as being practised on major works throughout the world, including the North Sea oil development, appears to place the UK several years behind in its thinking.

123. The suggestion that a draft code of practice be prepared could, I believe, in the current Institution climate, be self-defeating. Due to the failure of the ICE as a body to show any interest in the obvious lack of knowledge, it is unlikely that any document produced would carry much weight in the outside world. Secondly, project management by definition cuts across many of the traditional lines of responsibility and authority and as a large number of ICE members form part of the establishment or its supporting structure it is unlikely that the ICE alone can produce a document which will be of value.

124. I suggest as an alternative that a start could be made in remedying the situation by the ICE taking the lead amongst the relevant societies and institutions in founding an Institution of Project Management. Project management has application in such diverse fields and covers such a variety of disciplines that the support of all relevant bodies is needed. Such an Institution would provide a forum for all those interested and enable a body of worthwhile literature to be established, including a code of practice and recommended forms of contract.

Mr H. A. Croasdale, British Standards Institution

BSI generally supports the case made out in this Paper but was surprised that no reference was made to the existence of BS 4335: 1972 'Glossary of terms used in project network techniques'. This British Standard signified the first attempt at rationalization in this sphere and indeed has been taken account of by many other national standards organizations in the past few years.

126. The BSI committee responsible for BS 4335 (QMS/3/2, 'Project Management')

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recently commenced work on the development of a BS guide to project management using network techniques; four parts of which are at present envisaged:

- (a) organization, planning, review and report procedures
- (b) use of computers and coding systems
- (c) resource analysis and cost control
- (d) graphical techniques and symbols.

127. The first two parts of this standard are likely to be circulated for public comment later in 1977. Accordingly we think it advisable that any work on a proposed code of practice should take account of the BSI work in this field to avoid unnecessary duplication of effort, since the principles of sound project management are applicable across most industries and technical disciplines and are not unique either to the civil, mechanical or electrical, aircraft or particular areas of commerce.

128. Attention is also drawn to the fact that besides the existence of an Association of Project Managers in this country there is also the INTERNET organization which has a UK corresponding group, not to mention affiliations with the Operational Research Society.

Professor S. H. Wearne, Technological Management, University of Bradford

The Author rightly starts by discussing a definition of project management. The term is used differently in different sectors of industry. It is not used at all by some people who an observer can see are doing that job. Obviously what matters is that the projects should be managed, but in a professional Institution the need is to recognize the nature of the job so that members in project management can learn from each other. A recent paper by Patterson³ did attract some quite contrasting views.

130. It also seems obvious that the managerial needs will vary from project to project. Comparisons of examples indicate that managerial methods should not so much depend upon the technical type of project, but should be chosen according to situation variables such as the relative complexity, urgency and novelty of each project.¹⁰ In practice, many people tend to acquire the managerial attitudes and techniques in use where they are working—or rebelliously adopt the opposite. Neither may be appropriate. Opportunities to study the advantages and disadvantages of alternative methods are needed. I am not sure that an Institute of Project Management as in the USA could do this. The INTERNET meetings have moved this way, but are perhaps too general to help individuals in practice. On the other hand the study of engineering project management needs more than individual action within each CEI Institution. The one joint meeting in London in 1969 and the series of these run in Manchester since 1966 have shown how experience and ideas can be drawn together, but I am a biased witness of those initiatives. I believe that more could be useful, particularly for analysing the successful and unsuccessful lessons of smaller projects.

131. The Author concentrates on civil engineering and building projects. As no doubt he agrees, these may be only part of a customer's requirements. If so, organization of the project may demand compromises with contractual practice in other branches of engineering. Reconciling differences in responsibilities needs a project manager aware of more than his direct previous experience. Failures to see a project as a whole have contributed to several major engineering tragedies.¹¹

Mr Snowdon

Professor Trimble notes the diversity of projects and he is correct in saying that this causes a problem. The fact that a code of practice would be difficult to prepare should not be allowed to inhibit action. Nor is it sufficient to say that not enough is known about managers reactions to information systems. That is probably true and merits research. Improvement of project management, however, is urgent. In the strife for

perfection the best must not be the enemy of the good and one could always take account of future wisdom in up-dating and revision.

133. The argument that the best system is one in which maximum participation is achieved can be turned to make out a case for professional engineers taking initiatives in this matter. Since the case really hinges on a code of practice being concerned primarily with precepts, there would always be adequate room for individualism in their application.

134. **Dr Robinson** emphasizes the totality of projects and the importance of the client's point of view. I cannot agree, however, that an adequate code of practice can be found in any good management textbook. It may be that a distillation from the best books would come near to what is required provided it is given the correct perspective and put into context of the totality of multi-disciplinary projects.

135. There are several other references in the discussion to techniques and **Dr Robinson** specifically advocates a techniques manual. He may well be right and this is an idea worth pursuing. The point of the Paper, however, is to move away from the dictum that 'To use critical path analysis (or any other favourite technique) is to gain salvation'. I would welcome any improvement in management skill but the skill must be used to prosper the project and in the end that is the only justification for its use.

136. I do not disagree at all with **Mr Pearce's** analysis of the objectives and the stages but I am sorry that he does not see the benefit of a code of practice. I have only suggested (§ 17) that such a code is one of the actions necessary. I would hope that one result of a code would be that the subject would be less nebulous and less difficult to express.

137. **Mr Winston** suggests that the definition of project management in § 1 excludes surveys and feasibility studies. It was not intended to as Fig. 1 shows. However, **Mr Winston** obviously has the oil industry primarily in mind and these terms have special significance in exploration work. This lends additional weight to his plea that a code of practice should be flexible to cope with various organizations which may be required to accomplish different projects.

138. The concept of a code of practice containing a form of engagement was introduced by **Mr Rooley**. To my mind this is a separate issue and not central to the argument. It would, for example, be irrelevant where a project was managed by in-house resources and yet in this case the principles of good management would be just as desirable as when management is purchased.

139. The idea to an Institution of Project Managers (§ 12) was not my own suggestion. My belief is that it would be unnecessary if the existing institutions would accept an even more active role in promoting the idea that management is important. **Mr Thomson**, however, also refers to this subject.

140. The attempt to keep our feet on the ground by **Mr Rogers** was highly commendable and even the medicine which he administered had a pleasant taste. He sees project management as achieving the objectives set but I think that project management has also to do with setting the objectives, recognizing the constraints and evaluating the risks.

141. He raises two specific questions which might be answered by other contributions to the discussion. My view, however, is that a code of practice would be directed to and used by all parties to a project. This certainly includes the clients. His question on the demands to formalize activity is dealt with in §§ 9-16.

142. **Mr Faulkner's** suggestion that a guide to good practice might be more acceptable than a code seems to be supported by others. I would agree with a great deal of his comments provided that the development of the detail does not begin to be restrictive.

143. **Mr Cox** draws attention to the limited acceptance of project management in the public sector and certainly this is in accordance with my experience. If preparation of a code meant that benefits could be transmitted across such natural boundaries, that would indeed be another reason for initiating work.

144. In supporting the view that professional engineers or architects are preferred in the management role, **Mr Tattersill** asks who the boss is. I agree that a code of practice cannot necessarily answer that question in every case, but a code could recommend, for

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example, that all participants in a project should be given a clear brief and should understand their responsibilities precisely.

145. Among many valuable points **Mr Ingles** observes that the ideal situation rarely exists. In the particular context of organization and resource availability this is undoubtedly true. Does it not therefore follow that one characteristic of project work is that there must always be a striving to improve? Much of the discussion hinges on whether an established standard would be a restriction or a goal to be aimed for. This perhaps also is that point that worries **Mr Austin**, although he has additionally mistaken the attempt to keep the issues broadly based as implying vagueness.

146. It might need another paper to respond completely to **Dr Legget**. Perhaps I could modify his definition and suggest that construction management is that part of general contracting which ought to have the risk taken out of it! Even so the project management to which I refer can be aligned with construction management only if the latter is completely and genuinely orientated to the best interests of the project sponsor.

147. With regard to the 'well-tested consultant-contractor method', the problem is that previous orthodox practice is now insufficient. Who will control costs? Who will control the programme? How is the multidisciplinary content of an increasing number of projects to be adequately controlled? There is enough experience to demonstrate that project management is essential and the point seems to be accepted by most contributors to the discussion.

148. **Mr Croasdale** draws attention to the work of the BSI. The glossary of terms is a useful aid to communication but does not give positive guidance on action. However, I would agree with his advice to take account of the BSI work for exactly his reasons.

149. I am sorry that **Professor Wearne** should have thought I concentrated on civil engineering and building projects. I was certainly thinking of a wider field. It is also worth stressing that the situation variables to which he refers embrace people.

150. In conclusion, it seems that there is general acceptance that the management of projects is capable of improvement and therefore there is room for positive action. There is less conviction that a code of practice would meet the need, although the words 'guide to good practice' would apparently be more welcome. There is no doubt that a code or guide would not be the total solution to the present problems but this itself is no reason for inaction. The many interests of client, consultant, contractor, user and so on who are involved make it appropriate that a broadly based professional Institution should initiate action in these matters. In addition to technical quality of projects being a matter for professional concern it is also appropriate that matters of time and cost should be recognized as managerially important and handled professionally in an integrated manner.

References

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