



**MANAGING  
COMPUTER  
PROJECTS**

**STAN PRICE**

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Price Project Services Ltd, Manchester

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# PREFACE

When I started assembling the ideas, concepts and data for this book, its publication was far from my mind. My original intention was to produce a personal *aide-mémoire* for my own consultancy and lecturing. However, I am grateful for Andy Hofton's suggestion that it ought to be published as an *aide-mémoire* for my colleagues in the computer industry also, and in a form where it would assist managers facing the problems of computer projects for the first time.

A deep debt of gratitude is also owed to all my colleagues and ex-colleagues in the UK and USA who contributed ideas, suggestions and corrections to the project. I pay particular tribute to my technical reviewers George Sudbury, Robert Burford and Denys Moody and my proof readers and literary advisers Sheila Moody and Rosemary.

My gratitude is also owed to the staff of John Wiley and Sons Ltd for all their help and assistance, also to the staff of Commercial Communications Ltd for handling all the correspondence connected with the book. Thanks are also due to Ann Trewin for typing the first draft and the Wordplex Bureau, Manchester, for word processing later drafts, and the staff of Manchester Central Library in assisting my researching. Finally, Brian Moore, Tony Dean, Margaret Jones and my brother John for their miscellaneous assistance and all those who had to put up with my constant thinking aloud.

Stan Price  
Manchester 1986

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## CHAPTER 1

# INTRODUCTION

The purpose of this book is to improve the management of computer projects. It is directed particularly at those managers concerned with the acquisition of software and hardware systems to perform functions for which they are responsible. However, anyone concerned with the supply and use of such systems should benefit from a better understanding of the various stages of provision, and the processes, decisions and constraints involved in each stage.

Much of what follows is common to all management of projects. Although computers have been in commercial usage for over 25 years, for a variety of special reasons the precepts and maxims of good project management have not been applied as well in this field as in many other branches of engineering.

It may be that engineers moving into computing have found the intangibility of software a difficulty while those who have spent their lives in computing are not trained in engineering project skills. Other factors that may have influenced the lack of good project management of computer systems are:

1. The digital computer by its decision-taking capability makes the specification of requirements a much more demanding exercise than in other disciplines.
2. Computer personnel are more prone than other professions to an interest in the techniques of their work to the detriment of the function their work is to perform.
3. Computers have a direct impact on the established working practices of people and organizations, which makes any mismatch between design and use very prominent before the project task is completed.
4. The very terms 'general purpose computer' and 'software' tend to imply a high degree of flexibility in the system which is the end-product. Flexibility would not be expected if we were designing a ship or a house, and similarly where medium to large software systems are concerned this flexibility is largely an illusion. Any looseness in specification which this flexibility illusion encourages must therefore be vigorously guarded against.

The specification and design of software systems therefore need to be at least as thorough and the manufacture at least as rigidly controlled as complex pieces of physical engineering if completion is to be on time and on budget.

Readers may gain the impression from some chapters of the book that the customer/supplier relationship is entirely an adversative one. This is not so inasmuch as they have the overriding mutual goal of the implementation of a successful computer system on time and within (their own) budgets. The words in parentheses give the first indication of divergent interests towards that mutual goal. It is helpful for each party to know where these divergent interest could appear, and to that end they are clearly stated in the following pages: After reading this work, it will be realized that adherence to the principles and procedures laid down will minimize the chance that differences of interests will manifest themselves in conflict situations. If conflict does arise, the student of this book will know in advance what attitude is likely to be taken by the other party. The area most likely to fuel conflict is the interpretation of the specification and one must stress again the paramount importance of the system specification task.

The following chapters show the disciplines which must be enforced if project time-scales and budgets are to have a reasonable chance of being met. Like all good management textbooks significant attention is paid to the vital human factor. The book therefore defines as job titles the professional skills required at each stage to complete a computer project.

Finally it is important to stress that unless the stages laid down in this book are gone through it is highly probable that objectives and time-scales will not be met and budgets will overrun. Those involved in the estimating of computer project time-scales and requirements should elicit realistic estimates for each stage from those who have experience of what is involved and who will be personally responsible for each stage. Arbitrary management decisions on both timescales and budgets are the quickest way of ensuring that not only will a project not meet its objectives but also that it will fall well short of them. Much of the advice offered may seem to be blindingly obvious. Remember that many projects and whole companies have failed because people ignored what, with hindsight, appeared to be blindingly obvious. Conversely, projects and organizations often succeed because the participants keep asking the obvious as well as the technical questions and not resting until they have a satisfactory answer.

Sections A and B of the book concern themselves with a description of the necessary actions, alternatives and constraints that apply at each stage of the project to the customer and the supplier. Section C describes the necessary management procedures. Section D gives checklists for items to be considered at each stage or in the documents appertaining to stages. Section E lists all the clauses normally introduced into computer contracts. Typical customer and supplier attitudes to each clause are described along with a suggestion for a mutually agreeable compromise where necessary.



## CHAPTER 2

# APPLICABILITY AND ASSUMPTIONS

The disciplines and the methods of ensuring these disciplines described in the following chapters are necessarily aimed at the larger computer projects. With medium and small-sized projects, while the disciplines must be adhered to, the methods may be less formalized, but if objectives are to be met it is better to be slightly overformal than to err on the side of informality.

There are many ways in which a project can be executed. This book is written on the basis of the following scenario. We assume that a *customer*, an organization whose main business is not computing, seeks to obtain a system, an assemblage of hardware and software, from a *supplier*. We also assume that the customer wants the supplier to have the responsibility for providing the system in a state where it is immediately ready to use. A contract of this type is known as a *turnkey contract*, a term which summarizes the idea that, as with a car, the customer should only have to 'turn the key' and the system is ready to 'drive away'. It will become clear, in the course of the book, that if the key-turning day is to arrive in a useful timescale the customer is going to have to do a great deal more than just choose a supplier and wave a cheque exchangeable for the 'key'.

Three other scenarios are considered and dealt with as digressions from the main theme, namely the customer uses the hardware which he already possesses or purchases separately and:

1. Enters into a separate software development contract.
2. Purchases a package (existing piece of software).
3. Develops the software himself, usually in his own internal computer department.

The book assumes that only manufacturers' production line computers, computer peripherals and communications equipment will be used. Except in extreme circumstances only manufacturers' standard products should be used for such software items as operating systems, compilers, file handlers, etc. The design process referred to means the design of systems by the selection and integration of standard items of equipment and software with 'special-to-project' designed software to perform a definitive function. The

design of computer and computer peripheral hardware, communications equipment and standard software such as operating systems is not covered.

The book also assumes that an organization independent of any particular computer project, will have a coherent computer policy. An extreme example would be an anti-technology job protectionist pressure group having a policy that no computer usage was to be considered. At a lower level an organization that has a large electronic maintenance organization and possesses a large number of computers of the same type may have a general rule that all computer hardware maintenance on that type of computer be performed by its own maintenance organization. General guidelines about a recommended software language for applications of a particular type may also be present in order to reduce expenditure on staffing and training. What I am saying is that there should be corporate guidelines which will simplify the research, justification, planning and implementation of new computer systems. Like all guidelines they should be capable of justified revision perhaps based on a fixed periodic review basis.

## CHAPTER 3

# PROJECT STAGES

The first stages of the total project are the concern of the customer alone. The first section (A) of this book is therefore directed to his organization and actions he must perform, namely:

- Chapters A1–A3: the customer environment required for a successful project.
- Chapter A4: the feasibility study.
- Chapter A5: the customer's requirement specification.
- Chapters A6–A8: choice of a supplier leading to contract signature.
- Chapter A9: the customer/supplier's functional definition.
- Chapter A10: customer's monitoring of supplier's progress.
- Chapters A11–A12: customer's acceptance of the system and putting into operation.
- Chapter A13: running of system.
- Chapter A14: decision when to retire the system.

The supplier's view is in some ways a mirror image but he has different objectives, constraints and problems. Methods of defining these are described in the second section (B):

- Chapter B1–B2: the supplier environment required for a successful project.
- Chapter B3–B5: supplier's activities up to contract.
- Chapter B6: the customer/supplier functional specification.
- Chapters B7–B11: supplier's activities prior to acceptance.
- Chapter B12: supplier's acceptance activities.
- Chapters B13–B15: supplier's support activities.
- Chapter B16: supplier's activities after acceptance.

Even with the scenario defined in Chapter 2 on which the project stages are based, the reading of the whole of this book will help each party to consider and understand the activities, and problems, of the other. This is particularly important if one of the alternative scenarios is followed. It should be noted that when the software development is performed in-house fresh dangers are introduced by the blurring of responsibilities, thus adding to the difficulties of project management. It will not always be the case that a project stage has to be completed before work on the next stage commences.

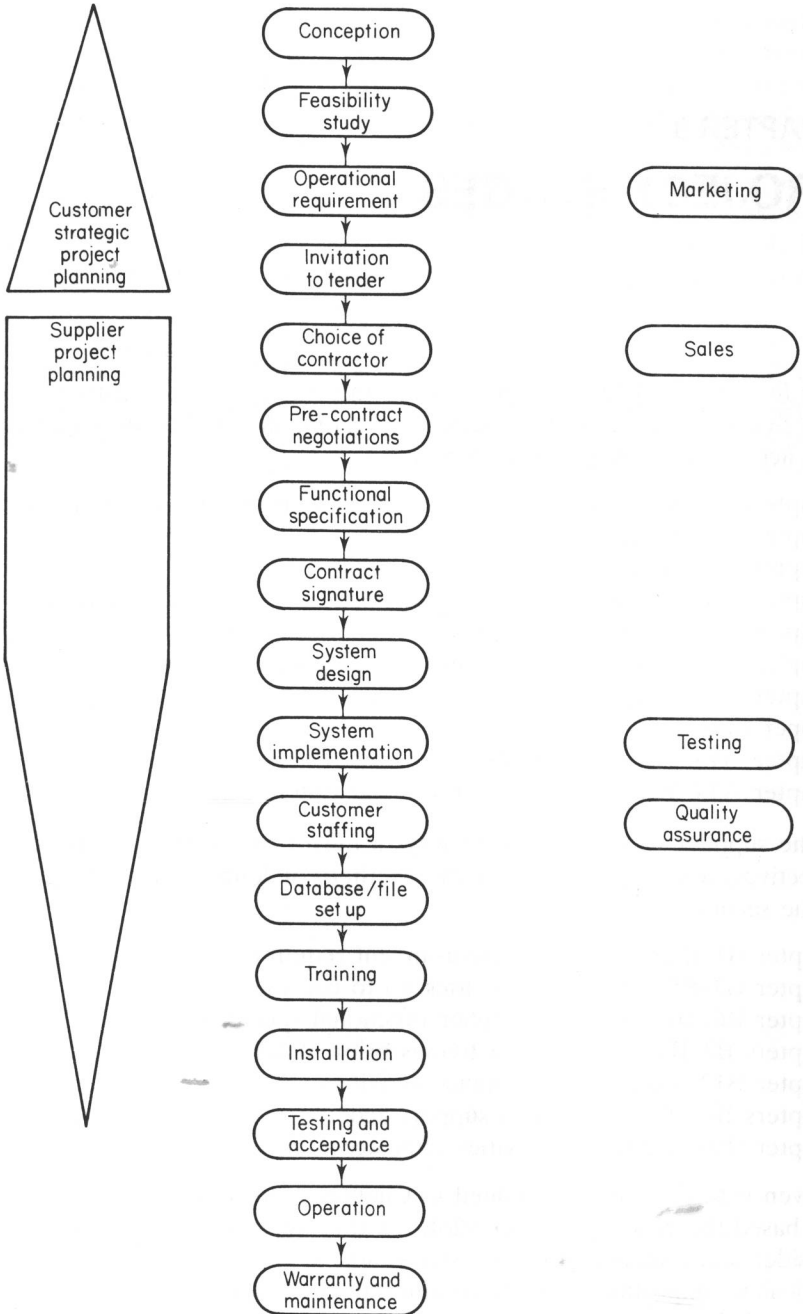


Figure 3.1 Computer Project Stages from Conception to Operation.

However, the strict sequence of stages should never be lost sight of. The sequential stages in the setting up of a computer system are shown in Figure 3.1. Figure 3.2(a)–(e) expands this into more detail, showing the connection between the various activities and the distribution of the responsibilities for these activities between customer and supplier. This shows the main scenario on which the book is based.

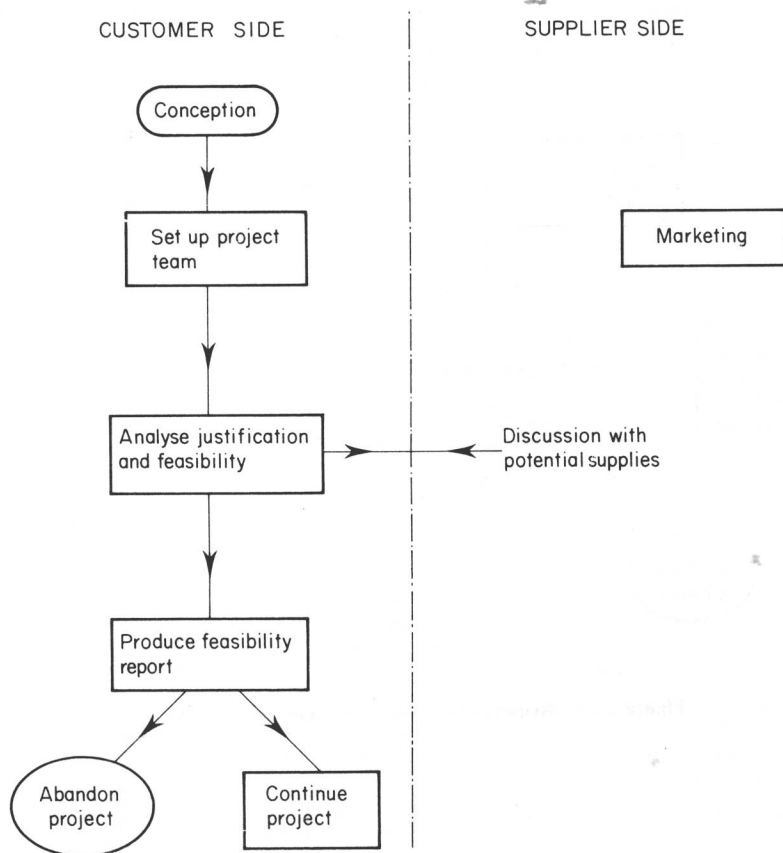


Figure 3.2a Feasibility Phase—Stages and Activities.

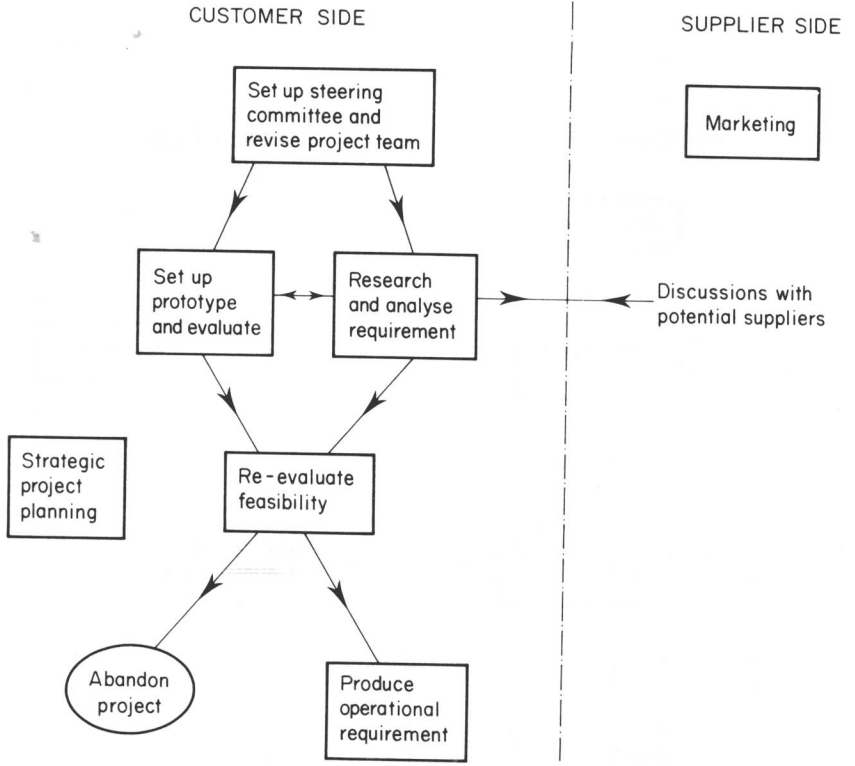


Figure 3.2b Requirements Phase—Stages and Activities.



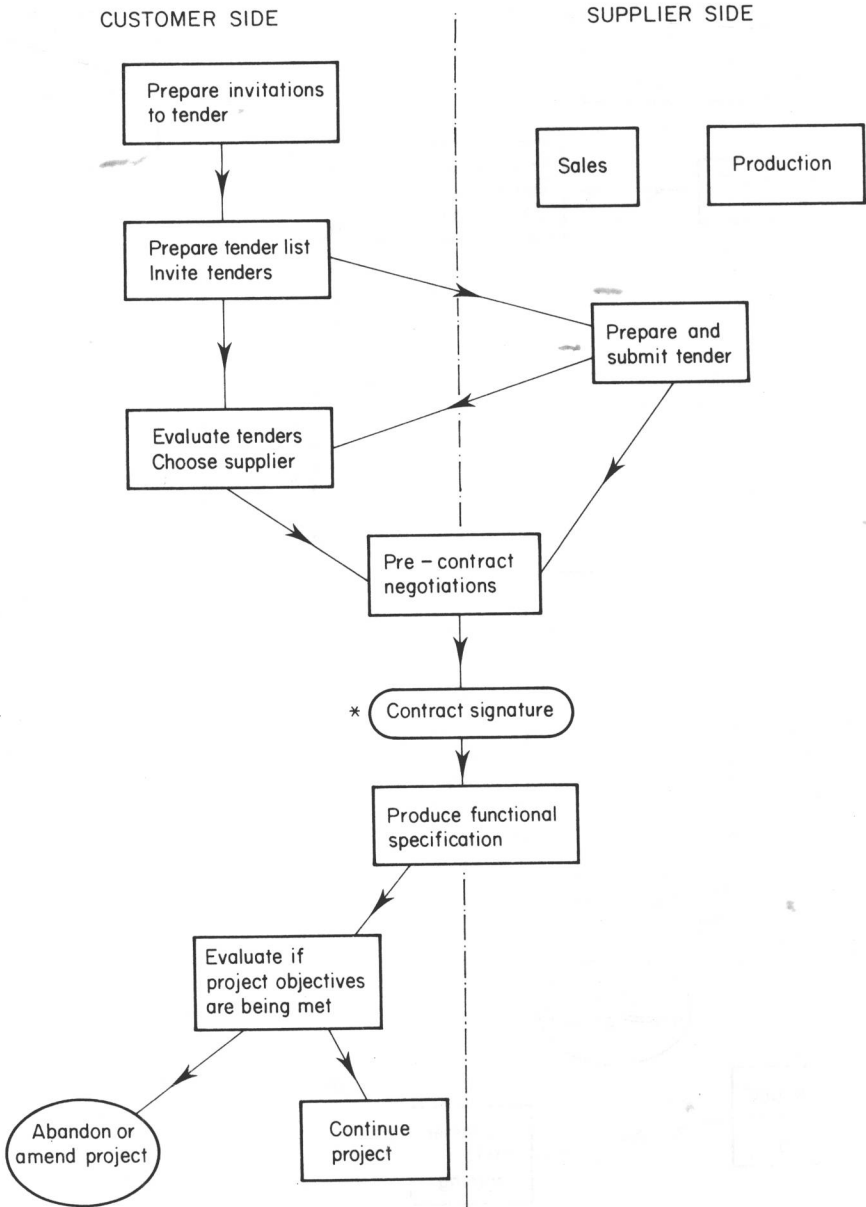


Figure 3.2c Contractual Phase—Stages and Activities.

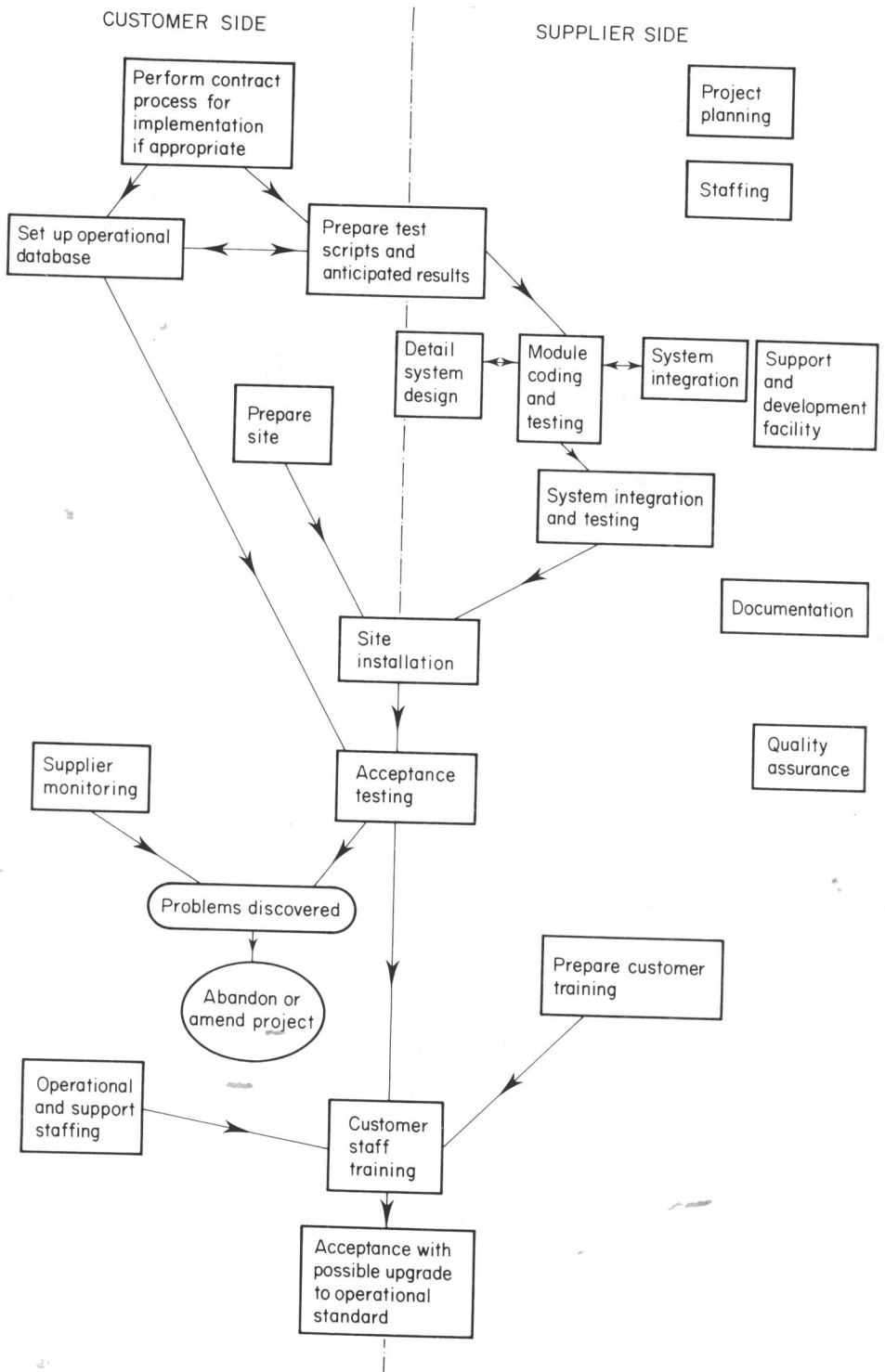


Figure 3.2d Implementation Phase—Stages and Activities.

CUSTOMER SIDE

SUPPLIER SIDE

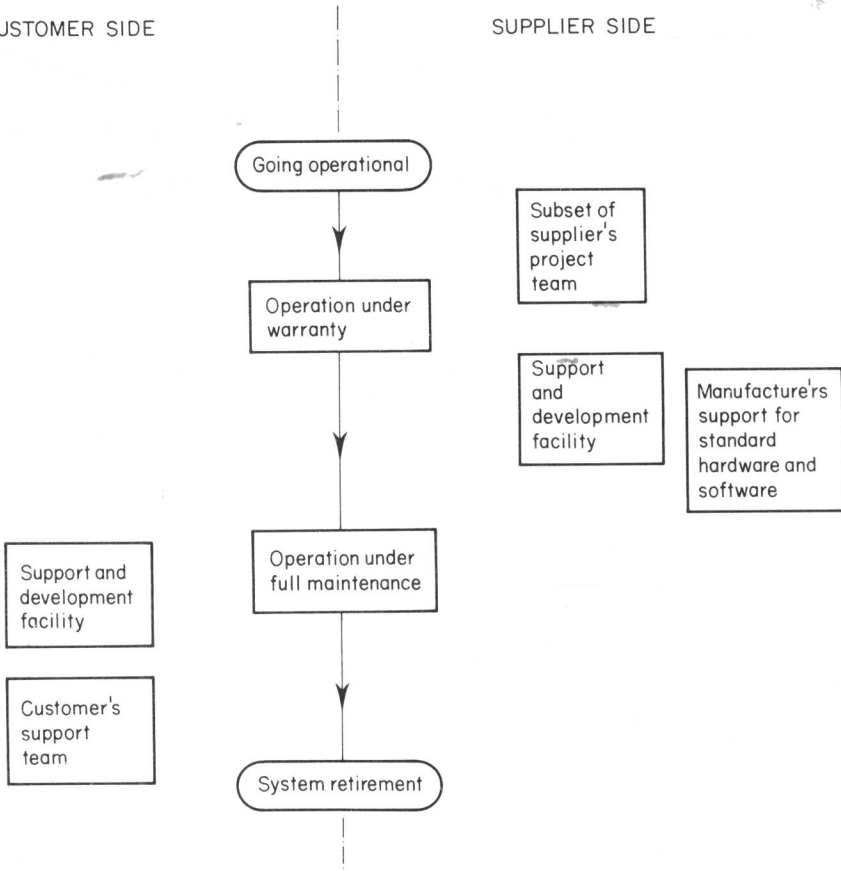


Figure 3.2c Operational Phase—Stages and Activities.