6. Is Instruction the Solution?

6.1 Approaches to the analysis of human performance problems

Level 1 analysis generates objectives at the job performance or subject mastery level. Level 2 analysis transforms these real-life objectives into instructional objectives, sorting out those that are worth teaching from those that are not. The criteria for this sorting out which we considered in the last chapter were:

- ☐ Are the objectives already known/mastered?
- ☐ Are they so easy to achieve that formal instruction is not called for (we simply need to inform the student what is expected of him and he will perform, since he already has all the component knowledge and skill requirements).

In order to establish the teaching worth of an objective, one questions or observes trainees and trained, collecting data for each task or task element, under headings such as:

- ☐ Frequency of performance
- ☐ Criticality of an error
- ☐ Difficulty in avoiding errors.

The logic is that frequently performed, critical and difficult tasks are obviously worth teaching (high priority in our 'worth league') whereas at the other extreme, rarely performed, non-critical and easy tasks are of low priority. Intermediate cases lead to intermediate decisions concerning whether or not to instruct and also give some clues on how to organize any proposed instruction.

However, training consultants in the industrial and commercial training field began to realize that such an approach sometimes led to training that was obviously not necessary (the instructor discovered that the trainees knew more about the task than he did) and, at other times, theoretically very effective training failed to eradicate the poor job performance that had instigated its design. So there was obviously more to analysing problems of poor performance than simply looking at the apparent difficulty of a task.

Praxeonomy

More sophisticated approaches to the analysis are required. Several training consultancy companies in the United States have developed techniques. Tom Gilbert, as ever in the forefront (and as ever fond of coining new and complex jargon), developed the technique of 'praxeonomy' and set up the Praxeonomy Institute to exploit it (Gilbert 1967).

In this approach, Gilbert presents four rules:

1. D=M–I (deficiency = mastery – initial repertory). We have already met this in level 1 analysis, as the difference in performance between the master performer and the target population.
2. Discriminate accomplishment and acquirement. A small difference in acquirement (what a person has learned) can make an enormous difference to accomplishment (what we can perform). To identify training needs one needs to measure acquirement, not accomplishment. This is not necessarily directly observable from performance on the job (which is accomplishment).

3. Discriminate knowledge deficiencies and execution deficiencies. An execution deficiency is when someone *knows* how to do something right, yet he does it wrong. He may do this for several reasons. Gilbert suggests inadequate feedback on his performance, interference between tasks, tasks which are punishing to perform right, and lack of motivation. To separate the two sources of deficiency, Gilbert suggests we ask 'could he do it if his life depended on it?'
4. Establish economic priorities (P = VN/c) or priority (of eliminating a deficiency) = value to be gained x number of people/cost of instruction.

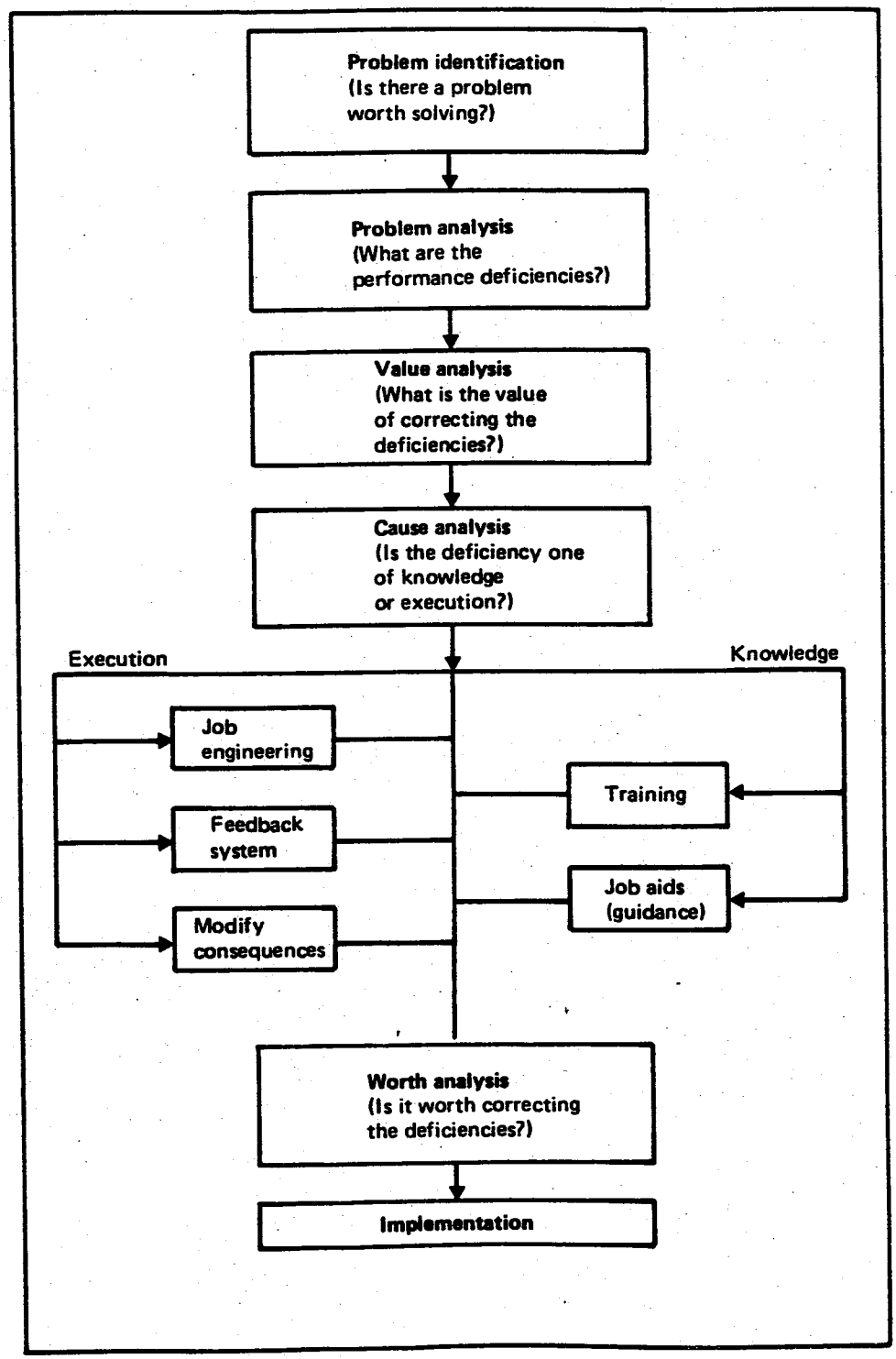

Figure 6.1 *Performance audit as used by Praxis Corporation*

Approaches to front-end analysis

In this chapter we shall concentrate on Rule 3 which really governs whether instruction is *at all* indicated as a solution to a given performance problem, or whether we should be planning other types of solutions, and what are these other types.

Similar techniques have been used by other practitioners. Harless (1968) calls his approach front-end analysis, a much more descriptive term than Gilbert's for a very similar technique. Harless argues that it pays to analyse the need to train before launching into the production of expensive training systems ('an ounce of analysis is worth a pound of programming').

In 1970, Robert Mager put pen to paper and popularized Gilbert's knowledge/execution analysis technique (as he had earlier done for behavioural objectives) under the title of *Analysing Performance Problems* (Mager and Pipe, 1970). He tried to present it in the form of an algorithmic flow chart or binary decision tree. However, this is not a very successful presentation as one can see (Figure 6.2) because the analysis process being depicted is not totally algorithmic in nature. There are bits and pieces of decisions hanging loose from the main trunk of the logical tree, like fallen leaves. This is not a criticism of the analysis process or the book, which is an excellent, clearly written and

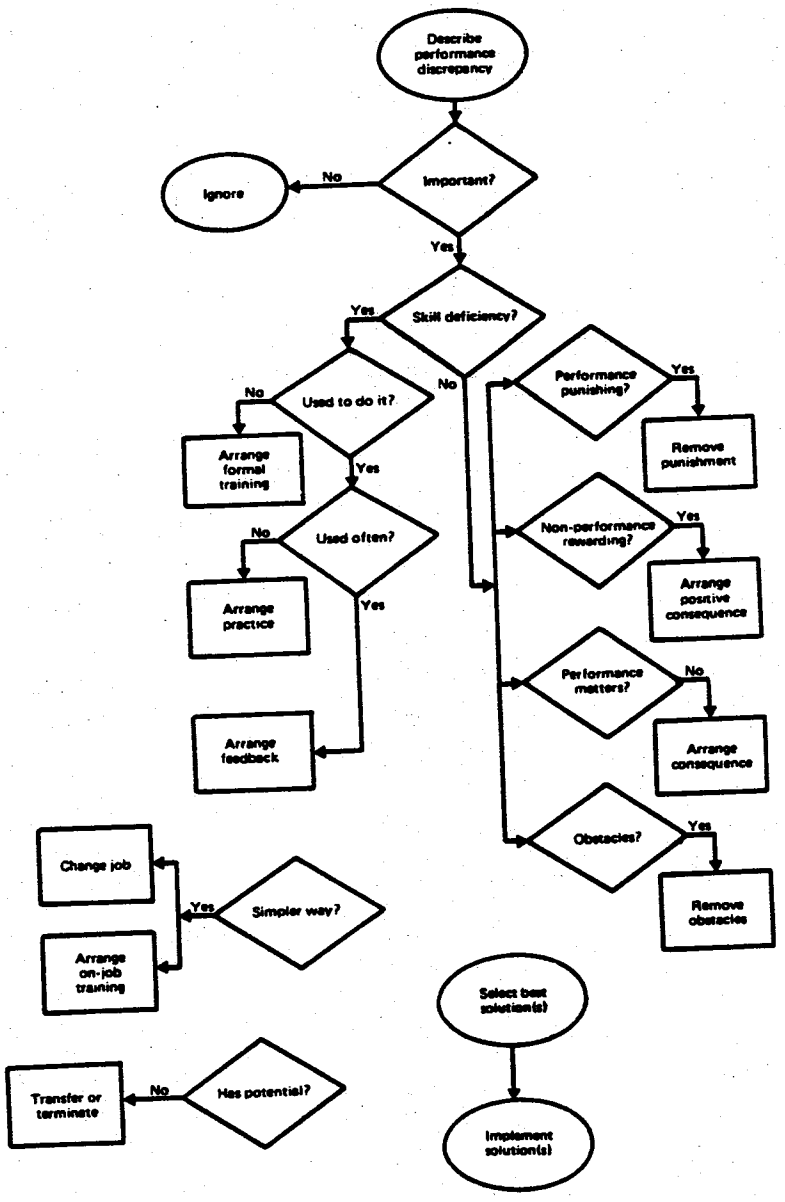

Figure 6.2 *The Mager and Pipe model (1970)*

(as always) entertaining presentatation full of convincing case studies and practical examples. However, the use of the algorithmic presentation may be misleading, by suggesting either that the 10 outcomes (eg remove punishment) are the only possible ones, or (more seriously) that because they are up different branches of the tree they are mutually exclusive. They are not. The answer to 'skill deficiency?' may be 'yes' so we are led to consider whether 'he' could have forgotten. The answer to 'used to do it' is 'no'. So we opt for training. But in reality, apart from this (correctly diagnosed) cause of poor performance, there may be others. There are obstacles to performance (poor tools), punishing aspects (correct performance entails much physical discomfort) and it does not seem to matter whether the job is done correctly or not (poor supervision), etc. So the individual is trained, transfers to the job and continues to perform poorly. Back to the drawing board (or rather the tree).

6.2 The systems approach applied to performance problem analysis

In teaching the front-end or performance analysis technique to training personnel, we have found it useful to get away from the linear or branched tree presentation to a more integrated, organic one, which would encourage rather than inhibit the combination of two or more part-solutions into a 'best solution'. After all, the systems approach suggests the search for alternatives and the subsequent selection/combination of these into an optimal solution 'mix'.

Alternative levels for system analysis

It may help to conceptualize the jump that is being made, in systems terms. The traditional job/task analysis approach assumes that instruction will probably be necessary. It remains only to define the objectives and content of this instruction. Perhaps as a result of the influence of the teaching profession in formal education, the training profession in industry tended to see its role as the increase in the amount of training offered. Whether this was due to an empire-building mentality or to a genuine belief that any (reasonably well designed) training *must* be beneficial to the individual and the organization, is not a relevant question to pursue here. Suffice it to say that much unnecessary training was (and still is) perpetrated on the human resources of many organizations.

The jump referred to is from one system level to another in the analysis of the problem. The traditional approach seems to begin with the training problem dumped on the desk of the training manager. He may well apply a systems approach to the problem, neglecting to notice that training problems cannot exist until the training exists and proves problematical (in the context above he is really presented the task of designing a training *solution* to an as yet unanalysed problem).

Micro level

So our manager analyses the job, related subject matter and the typical trainees expected to take part in the training (for training there will be!). He (1) defines the problem by deriving certain training objectives, (2) analyses these objectives to arrive at alternative training solutions, makes a cost-effectiveness study to select a particular solution or solution mix (but all the components in the mix are types of training), then (3) he designs and produces this solution, (4) implements the training, (5) evaluates it and finds that all the trainees reach a given standard on all the objectives. The only cloud which appears to dim this bright picture is the poor level of subsequent job performance of the trainees. The solution is to jump to the wider system and analyse the real roots of the performance problem. One might jump higher still and analyse the organizational environment, to establish that the supposed performance problem is not really something quite different.

Macro level

The steps of the systems approach will now follow the same pattern, but at a higher level. We can see the difference comparing the two flow charts (Figures 6.3 and 6.4).

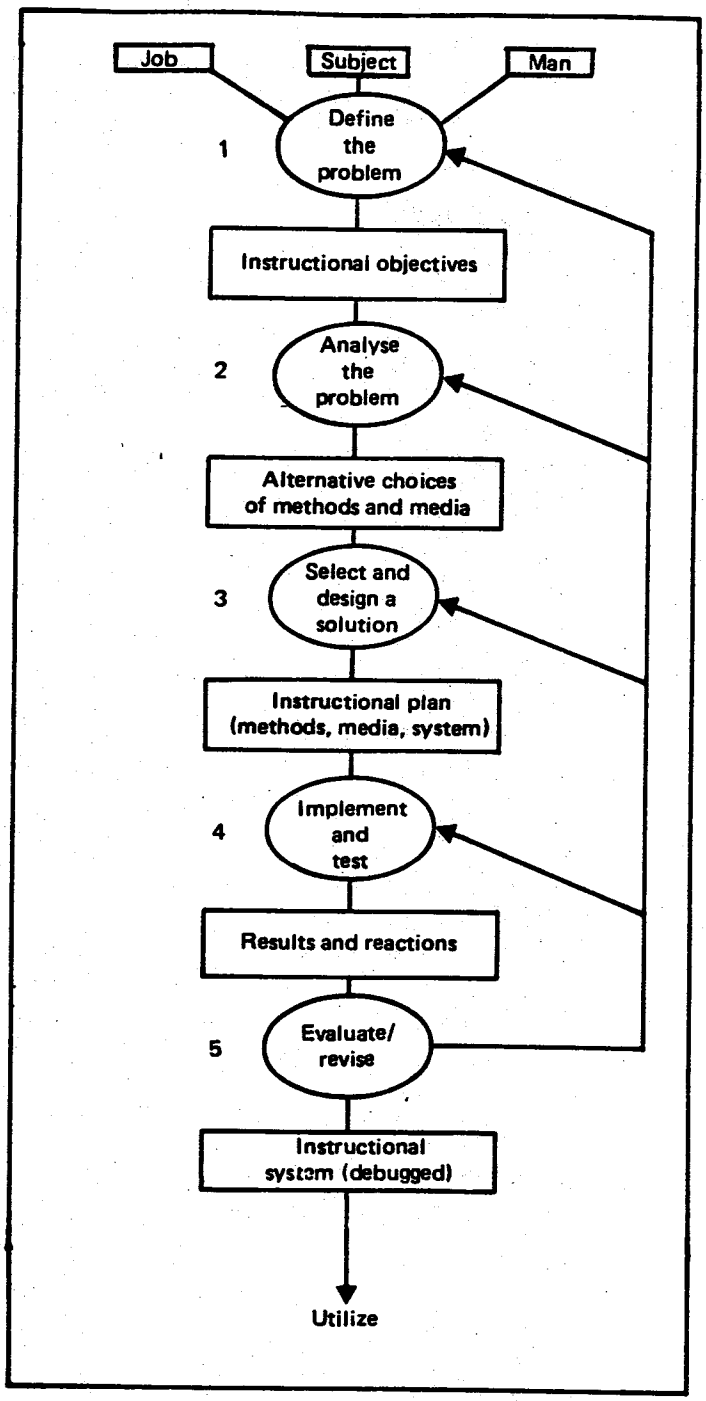

Figure 6.3 ***Systems approach at the micro level – applied to instructional design***

Step 1 will involve redefining the problem in quantifiable terms, establishing clear and measurable job performance objectives and identifying the environmental conditions which are required to make these objectives relevant and viable.

Step 2 will now be the analysis of the performance problem to identify all possible solutions and solution components, to evaluate the alternatives and to select the optimal mix of solutions (instruction, plus other types of training/development activity, plus other actions such as organizational change, job design, modified selection procedures, etc).

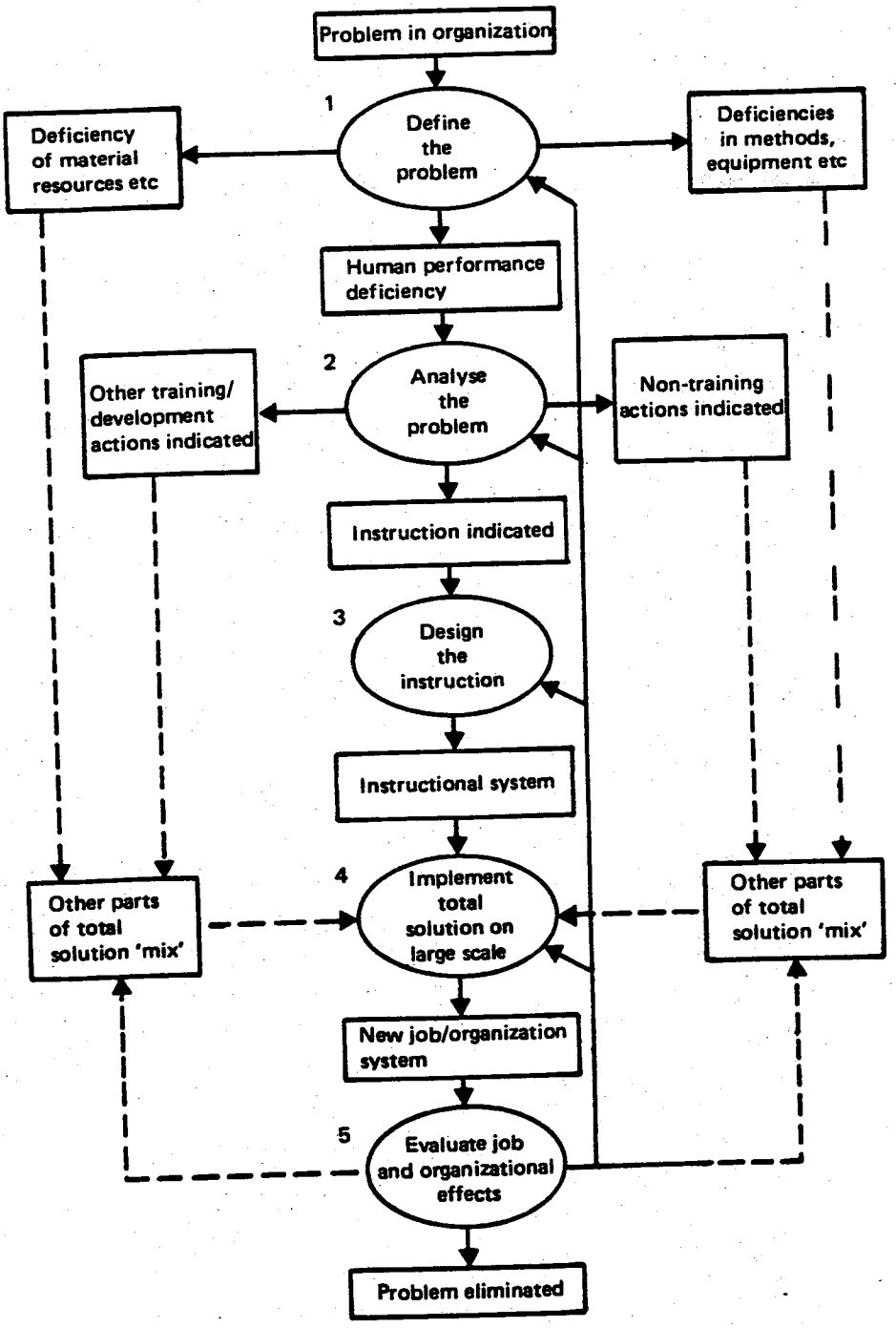

Figure 6.4 *Systems approach at the macro level – applied to the solution of any problem in the organization*

Step 3 All the components of the mix will now need to be developed in coordination (and they may be the responsibilities of different departments in the organization). Let us concentrate on the instruction component however. If there is an instruction component to develop, its contribution to the total solution (ie the job performance objectives) is by now defined. We are therefore at the same point (in principle) as we started from in the first flow chart. We would now:

- ☐ Develop instructional objectives
- ☐ Generate alternatives for instructional methods/media
- ☐ Develop the chosen solution

☐ Implement experimentally
☐ Evaluate.

So all of the micro level application of the systems approach is compressed into step 3 of the macro level application.

Step 4 In parallel to this activity, the other components are undergoing a similar process of systems development. Large-scale implementation brings together the various (already validated) components of the solution, and implements them jointly in the real organizational setting.

Step 5 Evaluation now occurs at the organizational and long-term effects level, to check that all aspects of the original diagnosis and the developed solutions are correct.

Let us now concentrate on step 2 of the macro level problem-solving approach. Since we wish to encourage rather than to inhibit the creative search for multi-faceted, multi-disciplinary solutions, we shall use a structural presentation of the analysis process, rather than a linear, semi-algorithmic approach.

6.3 Analysis of performance problems

The roots of the performance problem may be in the performer or in his environment. We should examine both, keeping in mind that the roots may be embedded in both of these sectors.

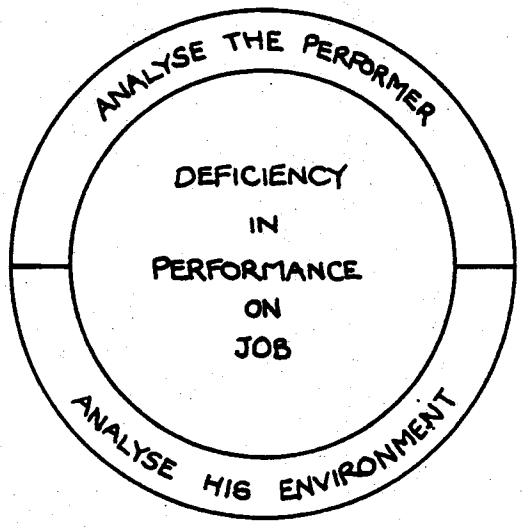

Figure 6.5 *Analysing the performer and his environment*

Could he ever perform the job well?

Analysing the performer sector we wish to investigate if he ever/never could perform satisfactorily. If he never could perform, then it looks like a training solution will be necessary. But wait! Maybe he has not got the prerequisites necessary to enter the training programme? If this is so, perhaps we can teach these too (but this may involve going back so far as to render the option uneconomical). The alternatives are transfer to simpler jobs or job redesign to eliminate the particular difficulty, which may be as simple as the division of tasks between supervisor and supervised (see Figure 6.6).

Does he have the prerequisites?

If on the other hand, the trainee has the prerequisites, we may consider instruction or other training alternatives. These other training alternatives may be as simple as the arrangement of opportunities for practice on the job (appropriate when the tasks are very easy to learn and there is no great danger or economic loss involved if the trainee makes a mistake). A slightly more sophisticated approach is to ensure that this on-the-job practice is performed under the supervision of an experienced person (who is not in any way trained

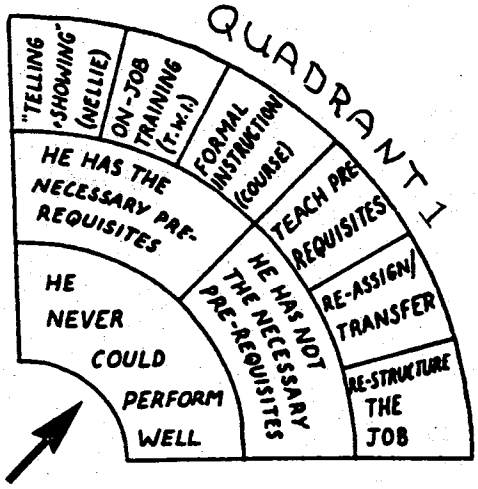

Figure 6.6 *Quadrant 1 of job performance schema*

as an instructor). This method is much maligned but often quite an adequate and economical training method. More sophisticated is the approach illustrated by the TWI training method. Only when the learning difficulty of the tasks justifies it should one invest in complete off-the-job programmes of carefully designed instruction.

What is the frequency of his performance?

On the other half of the upper sector (see Figure 6.7) we have a series of alternatives, depending on the frequency of performance and other subsidiary factors specific to each case. If certain tasks in the job are performed only on infrequent occasions then there is a chance of forgetting or part-forgetting how to perform. One solution is to arrange for more frequent practice by regular recycling or retraining sessions. This approach is indicated particularly when rapid reactions to infrequently occurring situations are required. There is no time to stop and refresh one's memory at the instant when the performance is called for. Examples are firefighting skills, warfare skills, self-defence skills, etc. However in many cases there is no such need for split-second reaction. The performer can take a reasonable amount of time to react to the situation. In such cases the expense of regular recycling can often be avoided through the provision of reference material on the job. Such job aids may be relatively complex and complete, as for example the workshop manual used by a motor mechanic when servicing or repairing an unfamiliar model of motor car, or can be quite a short, condensed list of key points in the form of a flow chart, checklist, diagram or wall chart. Examples include the lubrication charts for specific models of car often encountered on garage walls, wiring diagrams and parts lists, the checklist of operations that an aircraft mechanic must always complete when performing any servicing operation (to make absolutely certain that no step is omitted) and the aids to diagnosis, often in algorithmic flow chart form now so popular with computer and systems personnel and even used by doctors for medical diagnosis.

If, on the other hand, personnel used to perform well but now performance has deteriorated and the poorly performed tasks are performed quite frequently, then it is not forgetting that is causing the deterioration. Two very different causes may be at work. The job may be intrinsically boring, leading to a deterioration in interest and motivation, or the job may be in itself quite interesting and the performer may be quite motivated, but a sort of performance drift is occurring because the performer is insufficiently aware of the results that he is achieving. In the first case, appropriate solutions would

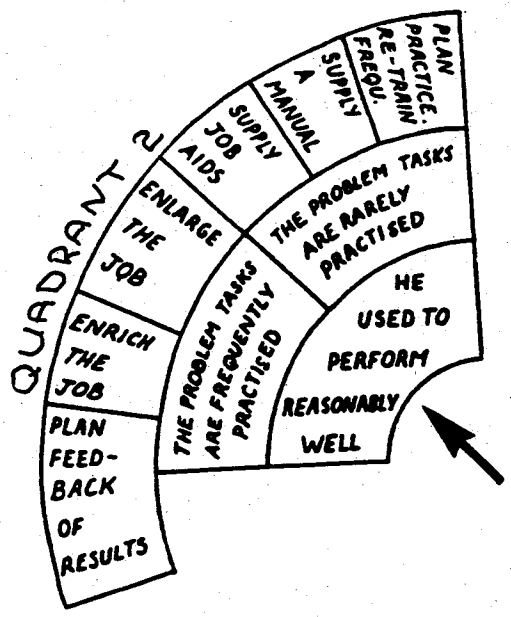

Figure 6.7 *Quadrant 2 of job performance schema*

try to make the job more interesting. Two well-known approaches, which both have their own literature are job enlargement and job enrichment: (Paul and Robertson 1970; King Taylor 1973; Thornley and Valentine 1968). Yet other approaches to making jobs more satisfying include job rotation and working in groups (see Figure 6.8).

What feedback does he receive?

In the second case, when the performer is not bored by his job but simply does not have information regarding the results of his performance, the solution is to provide such information by the installation of effective systems of information feedback. In a case known to me, the performance of the cost estimates department of a large steel fabrications company had drifted to danger point because the cost accountants working there were never informed of the final real costs of the projects that they had estimated. Over the years the cost accountants had developed 'quicker and better' methods of estimation which much increased the speed of their work and of which they were most proud. They were far from unmotivated and certainly not uninformed (as became painfully obvious when they were sent on a refresher course and taught the instructor a thing or two). The solution finally adopted was to feed back actual costs to the person that had made the estimate and to ask him for an analysis of the causes of any discrepancies. This simple change in procedure enabled the accountants to constantly monitor their own performance, to identify and improve those short cuts that really worked and to avoid those which did not.

The performer analysis schema

Thus we now have a complete upper sector of our schema (see Figure 6.9). This sector considers the performer and what he brings to the job in the way of necessary skills, knowledge and aptitudes. Our discussion has illustrated the value of asking certain key questions about the tasks in the job, questions that we have already met in our earlier discussion of level 1 and 2 analysis. These questions are:

1. *Frequency of performance:* to help decide between planned practice, retraining, manuals, job aids, job enlargement/enrichment and improved feedback solutions (note that other considerations enter here in the choice between specific solutions, but the frequency question helps initially to decide between two main categories of solutions).
2. *Criticality*, or the importance of good performance, which helps here in

Job rotation

One method of increasing variety in work is for people to rotate between jobs. This is usually done at regular intervals ranging from a few hours to several weeks, and is sometimes arranged on a less formal basis.

Job enlargement

This involves amalgamating several tasks into a single job, eg, instead of staying at one station and completing one-third of the tasks on every car, doing all the related tasks on every third car.

The intention of rotation and enlargement is to break monotony and relieve pace by lengthening cycle times. There can be some widening of interest. But it should be noted that if tasks have no intrinsic interest, are unrelated to one another, and are very short-cycle, combining them in either of these two ways may simply distract and annoy.

Job enrichment

A job may be enriched by an individual undertaking greater responsibility, eg, by organizing and checking his own work, or by being involved in decisions about planning and organizing the work of his unit. The content of the work is changed by extending the opportunities for decision and judgement. Job enrichment programmes attempt to build in, over time, scope for development of an individual's skills to provide a sense of personal achievement.

Group work

This approach entails dividing all the tasks into logical groups which reflect the informal group structure among the people doing them. Without an increase in autonomy, group working may not of itself significantly improve job satisfaction. What it usually provides, however, is an opportunity for the question of job satisfaction to be re-examined.

Autonomous working groups

This entails giving groups of employees wide discretion for planning and organizing work among themselves. The traditional role of supervisor changes to one of giving advice and support to the group. The group has clear goals, such as producing a specified number of units per week or completing a certain volume of work, while the means by which they are achieved are left very much to the group. An advantage of autonomous group working is that individual workers have some degree of choice as to whether they perform a large number of tasks or only a limited number.

Source: Adapted from HMSO 1975

Figure 6.8 *Some ways of making work more satisfying as defined by the Tripartite Steering Group on job satisfaction*

deciding the feasibility of less formal training solutions or of less controlled anti-forgetting measures (such as simple job aids rather than systematic and regular retraining). Note that a further useful question to ask in this specific context is concerned with the speed of reaction that is required.

3. *Learning difficulty*, which should throw light on the question of necessary prerequisites and whether, for the type of human resources that are coming forward to do a certain job, it is feasible to teach the prerequisites or whether this would prove to be less economical than other solutions connected with improved selection criteria or with job redesign.

Similarly, in the lower sector (see Figure 6.10), we encounter a series of solutions to unforeseen consequences (contingency management solutions) and a series of solutions to poorly planned work methods and organization.

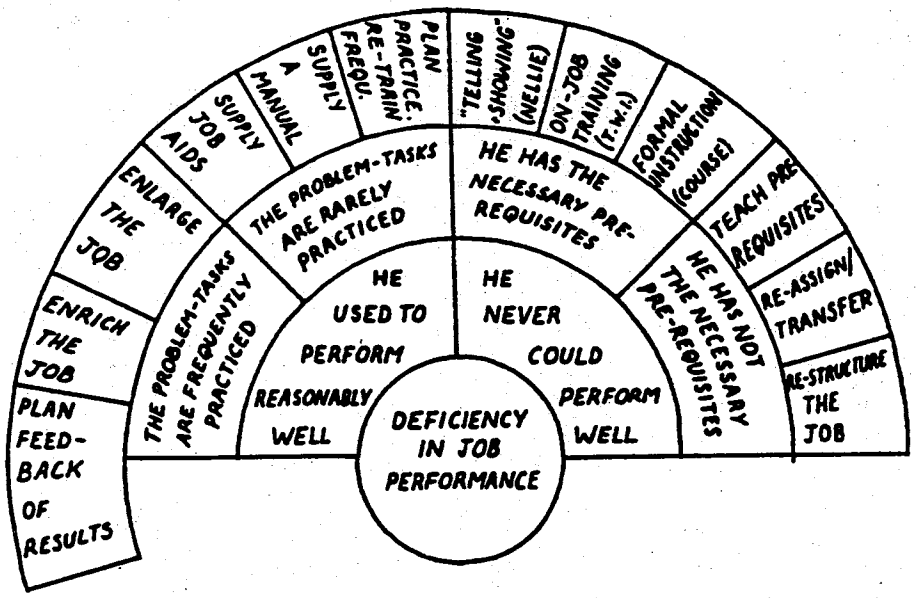

Figure 6.9 *Upper sector of job performance schema*

What are the consequences of performance?

Taking first the consequences of performance, we note an overlap with the previously discussed sector: there may be no consequences to his performance as far as the performer is concerned. If he never knows the final results of his work, how can he try to improve his performance? If no one else in the organization seems to be taking an interest in his performance, why should he strive to improve it? So there are two aspects to 'no consequences', one concerned with establishing standards and furnishing results so that the performer has the tools necessary for self-evaluation and self-improvement, and the other concerned with showing that 'somebody cares' about the standard of his performance. This second implies a system of reward for good performance (not only financial rewards but also rewards of a social nature – recognition, approval and encouragement of the desired performance).

1. No consequences

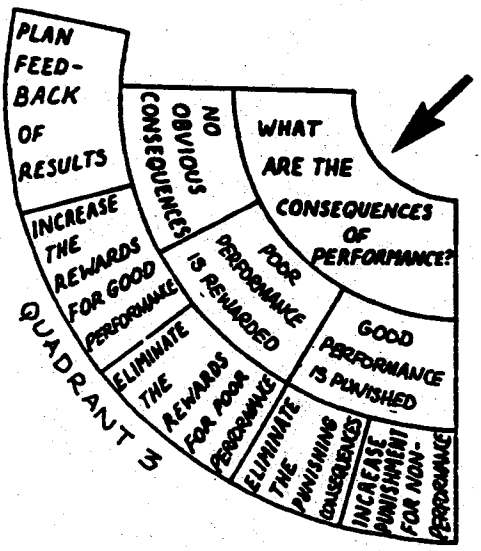

Figure 6.10 *Quadrant 3 of job performance schema*

2. Poor performance rewarded

Analysis of the consequences of desired performance often reveals severe weaknesses in the reward structure, particularly the unplanned (social and work environment-generated) rewards. Undesirable performance is often rewarded unwittingly, as in piece-work payment schemes which are designed to encourage fast work and high productivity, but as a by-product encourage sloppy or downright dangerous work practices which save time. In one motor car bodywork factory, despite the most careful attention paid to all aspects of safety, despite all machines being equipped with the best possible safety guards, many serious accidents occurred every year. It was found that the cause of this was the piece-work payment system. Rather than lose one piece of car bodywork because of a badly positioned metal panel in the press, men were vaulting the safety guards as the press was in operation in a last-minute attempt at readjustment, and were sometimes just that second too late in getting out again; rather than lose production they risked losing a piece of their arm.

Poor performance, or the failure to perform, are often reinforced socially, as in the case when it has become a tradition in a particular work environment to work without the use of safety clothing or equipment. Anyone using the safety equipment is ridiculed by his workmates while the non-use is rewarded socially by the acceptance of the worker by his mates as a 'real man'. I once worked on a project preparing a training course for post office workers in the UK. This course included training in the use of equipment for testing whether there were any toxic or explosive gases trapped in underground installations before the man went down the manhole. The equipment was quite complex and we decided to perform an analysis on the job. However, this soon revealed the important information that hardly anyone uses the equipment although all the telephone maintenance vans were equipped with it. The men preferred to 'use their nose' as a test device: this was much quicker (one type of reward for non-use of the equipment) and was the traditional way employed by the senior and more experienced members of the team (creating another source of social reward for the new worker). In terms of ensuring the desired performance, the training aspect was quite dwarfed by the contingency management aspect of overcoming the negative consequences.

3. Good performance punished

Finally, many instances can be quoted of the desired performance being unwittingly punished. The performer knows quite well what is expected of him, but the actual performance is physically uncomfortable or socially threatening. The performer attempts to avoid the punishing or threatening aspects of the job and this results in poor job performance. An example quoted by Gilbert (1967) concerns maintenance personnel of a company specializing in the installation of air conditioning systems in office blocks. These systems often got blocked (always in the summer of course) which required the maintenance personnel to apply heat with a blowlamp to the blocked pipe (always in some cramped, unventilated, already hot cupboard or underfloor duct) until the salts causing the blockage had all entered back into the solution. This required time and the pipe invariably became partially unblocked long before all the salts had dissolved. The man tended to stop applying heat as soon as the circulation restarted, rather than continuing for another half hour or so in extremely uncomfortable conditions in order to make absolutely sure that the blockage was completely eliminated, with the result that in a week or so the pipe would block again requiring a further visit from the maintenance team. As in this case there was no way of eliminating the punishing consequences of desired performance (how do you stop an underfloor duct from being hot and cramped?) the adopted solution was to create a threat of equal punishment for non-performance, not by inventing disciplinary threats but by an organizational change which made each maintenance man responsible for a certain group of installations. Thus poor performance on the first visit bore the penalty of an early future visit to do the same uncomfortable task again and to face the same irate customer again.

My own experience includes a somewhat more subtle case, involving the

performance of bank managers. The objective was to get the managers to lend money more creatively in support of new, untried, potentially high risk industrial projects. Pamphlets, pep talks and training seminars had already been tried with very little result. Analysis of the consequences soon showed that there were no obvious consequences for the manager resulting from good performance, but the occasional bad debt (which would increase if the high risk lending policy were followed) invariably led to unpleasant repercussions. Thus a two-pronged solution was adopted, involving the orientation of top management as regards their reaction to bad debts (apply critical analysis and constructive suggestions rather than disciplinary measures) and the installation of a feedback and reward system to reinforce the desired behaviour (publishing and circulating reinvestment data to all branches, publishing articles on successful reinvestment case studies, making reinvestment count as one factor in a manager of the year competition, etc).

How is the job organized?

Passing now to the sector of analysis dealing with the internal organization of the job, we enter the fields traditionally occupied by work study, methods study, organization and methods and, more recently, organizational development. All these disciplines have their own literature and a host of techniques too numerous to describe fully in this book. Suffice it to say that problems which at first present themselves as potentially requiring a training solution, often on more careful analysis are found to have job organization aspects as well. The problem may lie in the physical and practical aspects of the job (bad equipment, poor layout, poor lighting, uncomfortable conditions, etc) or in the methods used (inefficient methods, unnecessarily tiring methods, inefficient sequence of operations, poor division of tasks, etc).

Note that some of these causes may have the results of making the job unnecessarily dissatisfying (see Figure 6.9) or may create unpleasant or punishing consequences resultant from desired job performance (see Figure 6.10).

Alternatively, one may identify problems in the managerial organization of the job (see Figure 6.11). The problem may be poor supervision, no clear job targets, no measurement of job performance against targets, etc. Or it may lie in the basic management organizational structure relating the performer to his superiors. To quote the gospels: 'No man can serve two masters'. Whereas this

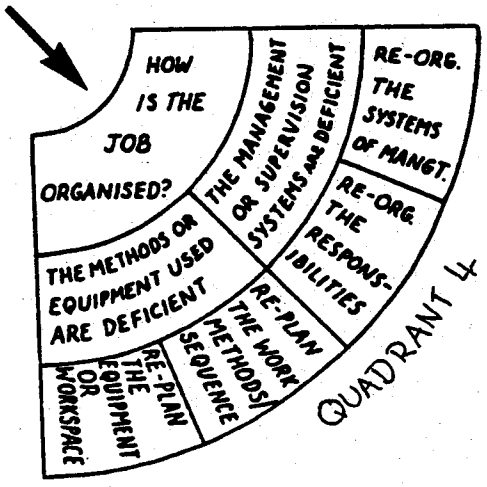

Figure 6.11 *Quadrant 4 of job performance schema*

is somewhat of a generalization (most matrix-based management systems include line responsibility and project responsibility) it is essential that in cases of mixed responsibility, the different aspects of a job for which different managers are responsible are clearly delineated and the job is organized so that the performer does not encounter a conflict of responsibilities. (Give to Caesar what is Caesar's and to God what is God's?) Mager (1970) quotes a neat example of this: the case of a medical technician who must perform certain tasks which involve continual painstaking attention over a period of time (preparing samples for microscopy) whilst he is also called to attend to a variety of other urgent tasks in the casualty ward at unpredictable intervals. Such 'task interference' inevitably results in poor job performance.

Note again that some of the causes mentioned will result in the creation of demotivating job conditions, jobs which appear to be of no consequence or where the avoidance of job performance is more rewarding/less threatening than the execution of the desired job performance.

The complete performance analysis schema

We have now completed constructing an analysis schema for performance problems. We call it a schema because that is what it is intended to be, an interrelation of the many aspects that might contribute to any given performance problem.

The schema (Figure 6.12) is not necessarily complete. As any conceptual schema it is subject to constant adaptation as new phenomena or new information is encountered. However, we believe it will be easier for the reader to adapt a schema as presented here than to adapt a semi-algorithmic presentation (eg Mager's) which carries with it the connotation (as do all

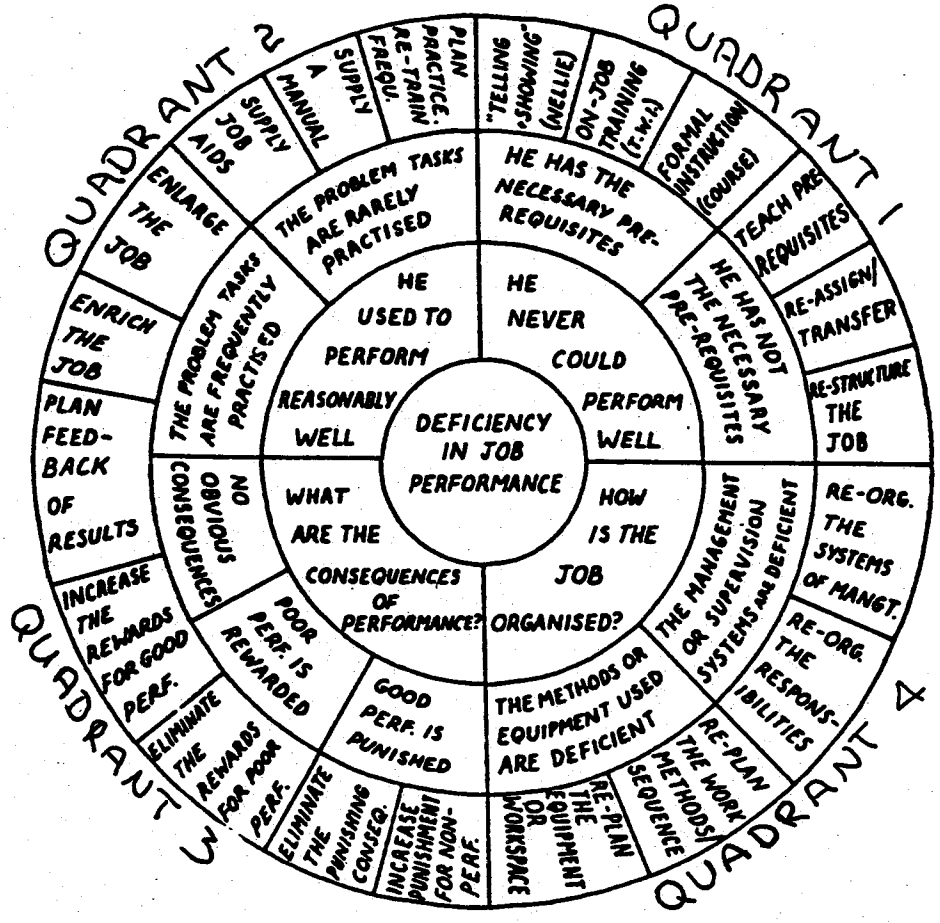

Figure 6.12 *An analysis schema for performance problems*

algorithms) that every problem has a unique and predictable solution.

Systemic thinking

The schema emphasizes the flexibility and the overlap that exists in the process of selecting a solution. No sequential steps of analysis are implied. Rather, the reader is encouraged to think *systemically* of all the factors in relation to all the others. Theoretically, almost any combination of almost any of the 20 types of solution listed in the outer rim of our circle could be selected as a specific 'total' solution to a specific complex, multi-faceted performance problem. In practice, some of these solutions are mutually exclusive so the sum total of viable alternative choices is considerably less than the theoretical total number of possible combinations (640,000) but would still remain in the thousands.

A plea for a multi-disciplinary approach

Finally the schema emphasizes the importance of a multi-disciplinary approach and the prerequisite of effective horizontal communication and cooperation in the organization, so as not to artificially restrict the choices of solution open to us. Figure 6.13 emphasizes this point. We remove the outer ring of solutions and replace it by an indication of the six types of support services which might exist in a typical large organization and which might be concerned with developing certain types of solutions to performance problems. Any combination of these six types of intervention might be quite a viable total solution to a given problem. This gives us a total variety of 63 different combinations of departments (or 63 different possible structures for the plan which is to solve the problem). Any lack of horizontal cooperation will severely limit this variety. It is not uncommon to meet instances in reality where this variety is limited to one, for example the problem is first brought to the notice of the training department so you can be quite sure that a training solution will be produced (a purely training solution).

If there is one thing that renders systemic thinking impossible, it is the compartmentalization of one's problem-solving schemata into watertight compartments.

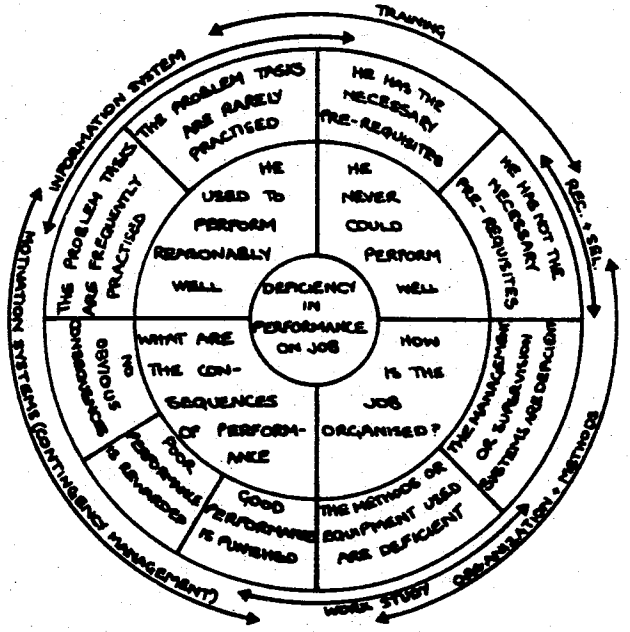

Figure 6.13 *The need for interdepartmental cooperation*

6.4 Training (and other) needs analysis

I was recently involved in the planning and implementation of a system of training needs analysis for a large group of companies employing some 80,000 persons. It was a good opportunity to attempt to install a system of performance problem analysis, based on the methodology described above.

The organization did not have any working system of regular job performance evaluation, and the various companies of the group were extremely varied in their approaches to training (if indeed they had one), the data which they kept regarding personnel problems, operational problems and so on.

As it was already planned to train several training officers, who would, among their other duties, perform training needs analyses in their companies, we incorporated the performance analysis methodology as a part of the training needs analysis methodology (which should perhaps now be called a training and other needs methodology).

In adapting the method to the needs of a large organization, one had to take another look at the system, but this time the wider system. We found ourselves analysing not only obvious skill and knowledge deficiencies but just about every other possibly imaginable type of problem that a large organization can have. Slowly a practical methodology emerged, which seems to be working reasonably well and is having quite unexpected success in breaking down the barriers to horizontal communication between departments, from which the organization used to suffer severely. The methodology will not be presented here in full but rather the theoretical thinking behind it will be explained, as it is an extension of the approach adopted to performance problem analysis.

Typical approaches to training needs analysis

As training is generally held to impart knowledge and/or skills, the implied problem that the training needs exercise sets out to solve could be stated in the form of a discrepancy between the existing (what is) levels of knowledge or skill of certain groups of the workforce, and the desired (what should be) levels. We may note a hint of a suggested solution in this statement. Training is the solution, for which problems are being sought. This in itself may not be bad, as long as it does not encourage the needs assessor to force training solutions on problems that do not warrant them.

Unfortunately, quite often the techniques applied for training needs assessment actively promote the solutions-seeking-a-problem syndrome. Among such techniques we can mention:

1. The *course menu* approach adopted by many companies. The training department draws up a catalogue of training schemes and courses (both internally organized and externally available) which it circulates to all departments down to supervisor level, inviting management and supervision to identify useful programmes and propose participants from their staff. This suffers from several weaknesses. Staff who are not training experts are expected to match their inexpert judgement of the training needs of their staff to the ill-defined objectives or content of the training programmes listed. It also encourages the use of training 'because it is there', irrespective of whether there are any benefits to be gained. This was quite an economically useful exercise in the early days of the Industrial Training Boards in the UK. Any training (even unjustifiable and ineffective) could be claimed for in the training grant (currently in Brazil the exercise is even more profitable, as companies may discount double the cost of any training from their income tax bill). However, these are artificial and transitory situations, which vanish as one develops the means to check the quality and usefulness of the training, as well as the quantity. The longer-term value of the course menu approach is very doubtful.
2. The *training needs prescription* approach. Management and supervision are requested to complete a questionnaire or form, specifying their projected manpower needs for a period (say one year or six months) ahead, and the training/development needs of existing staff. The exact format and content of such forms varies, but typically they may request a specification (in both quantity and type) of the training needs of the department or section. Often, the probable recruitment sources of new

staff are indicated, sometimes also the selection criteria which should be applied are given. The type of training may be stated in subjects or topics or else in the form of objectives.

The weaknesses of this approach are similar to the menu. Staff are requested to make judgements of training objectives or content, without necessarily having the skills required to do so. Also, the returns from each department tend to be parochial. Each sub-system states its needs without too much concern for how these relate to other sub-systems. It often proves difficult for training departments to analyse the returned forms and integrate them into a coherent company training policy and programme.

3. The *job performance evaluation* approach. This is based on a regular evaluation and report of the performance of each company employee by his superior. In theory these reports should serve as the basis for, among other things, the design of individual training or development programmes for each employee. In practice, the amount of data generated in a company of any size is such that it becomes difficult to handle unless some sophisticated methods of data processing are used, and these generally mean that the data has to be categorized in such a way that much of the individualized nature of the approach is lost. If the procedure is restricted to the appraisal of key personnel, as opposed to all personnel, (the rest being treated as occupational or job groups) the data becomes more manageable. This approach is certainly a better way of assessing the training needs than the previous two, as generally the analysis of the job performance evaluation, with a view to specifying training, is performed by specialist training staff. However, it shares one weakness with the other two, namely that it amasses a mass of data from all departments of the organization, which then has to be sorted through without any basis upon which to assign priorities. As the amount of data is often very large, the training staff may spend a lot of time on relatively low-priority problems before unearthing a high-priority one. This approach should be used as part of a broader and more flexible systems approach.

The systems analysis approach

The systems analysis approach recommended here attempts to create a basis for establishing priorities among the problems to be tackled, thus enabling the training department to get on with the solution of high-priority problems, while still collecting data and analysing lesser-priority problems. The stages of the approach are as follows:

Stage 1: Identify problems and priorities

1. Build a functional model of the organization. Identify the chief functions performed by the organization and draw a functional flow diagram to illustrate how they interact with each other. This diagram may be devised from the organization chart, but it would not be exactly the same, as several functions are occasionally grouped in one department of a company. The object of identifying all the functions is to then identify sources of information.
2. Identify the most reliable sources of information for each of the functions identified. This would include the people responsible for the execution of the function, departmental reports, documents, financial statements, etc.
3. Interview and study these sources, from the following standpoints:
   (a) What are the problems (present and future) that you see in the internal operation of the function?
   (b) What are the problems (present and future) that other functions with which you interact may cause for you?

In systems terms, this amounts to asking: what is wrong with the processes operating within the sub-system? What is wrong with inputs from other sub-systems? These are the two factors which may influence

the outputs from the sub-systems.

4. Identify the human resources aspects of these problems? Attempt to specify these in terms of both the quantity and the performance requirements:
   eg What is – current quantity of human resources
   – current quality of performance
   What should be – quantity
   – quality of performance.
5. As the analysis progresses, function by function, it is useful to complete a control chart, like the one shown in Figure 6.14.
6. Establish a priority among the problems. This would be on the basis of:
   Worth – what will the organization gain by solving the problem
   Urgency – is the problem present/future, growing/static, etc.

		Existing problem	Predicted problem
Problem inside department	Deficiency cost to company number of people urgency		
Problem when interacting	Deficiency cost to company number of people urgency		

Figure 6.14 *A control chart*

Thus we see that a human resources problem may be quite complex. It may be composed of four key factors:

- ☐ The type or quality of persons required for the job
- ☐ The quantity of persons available for recruitment and training
- ☐ Existing problems of job performance or of recruitment/selection
- ☐ Future needs to be created by changes in or growth of the organization.

All four of these interact and are present to a greater or lesser extent in any human resources problem area. We may visualize this as in the circular diagram (Figure 6.15). The object of the circular presentation is to emphasize the organic integration which exists between the factors. We shall be using this form of circular presentation frequently. As an example of the integrated, complex nature of most human resources problems, consider the possible effects of a new product being launched; new operative level staff to be recruited and trained in new techniques; existing supervisory/management staff to be prepared for the changes; internal transfer/retraining to be arranged for staff becoming redundant due to the product change; new attitudes to be formed; labour turnover rates to be predicted; etc.

In order to identify all the possible factors of the problem, the training needs analyst must understand it in depth. He may at this stage need to refer to (or to perform if one is not in existence):

- ☐ An analysis of the existing job or jobs. The results of such an analysis are usually presented as a job description, which lists all the tasks and duties involved, together with necessary explanatory details and also the characteristics required of the person performing the job.

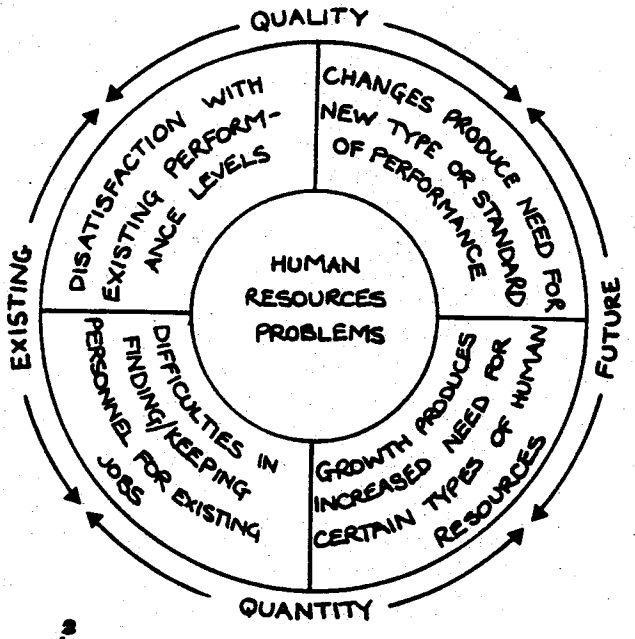

Figure 6.15 *A schema for analysis of human resources problems*

☐ A synthesis (or modelling) of the future job.

When stage 1 analysis has indicated that because of technological, organizational or policy changes a new job will be created requiring a new, hitherto unused, type of trained person, a prerequisite to analysing the type and availability of recruit is to form a clear idea (model) of the tasks he will perform. This we shall call a job synthesis (as opposed to a job analysis) as it involves the putting together of the tasks that a new process requires (ie one or more proposed job descriptions).

This job description, whether of an existing job, or a model of the future job, can be used to estimate to what extent training should be considered with other approaches. Using the job description, one thinks through the supply/demand aspects, the performance deficiency aspects and the staff development aspect of the problem. Doing this may suggest potential sources of difficulty, which may be avoided by redesigning aspects of the job even before it passes from the theoretical model stage. To think through an analysis of this sort effectively in general requires a fairly experienced analyst, who can identify analogies between the job being studied and similar situations he has encountered. This is what we shall call stage 2 of our system for training needs analysis. Having identified the most important aspects of the problem in stage 1, we now proceed to a more detailed analysis of the relevant aspects. There are three routes and we may need to follow one, two or all of them. Whichever of the three routes are followed, one is led to consider if training is really a part of the optimum solution, and, if so, what are the desired outputs of the training?

Stage 2: Analyse the problems

While stage 1 is continuing, one can proceed to the more detailed analysis of an already identified high-priority problem area.

As the flow chart (Figure 6.16) indicates, stage 1 may have defined the problem in terms of:

☐ Poor performance of existing human resources
☐ Inadequate numbers (now or in the future)
☐ New types of human resources need
☐ Or any combination of these.

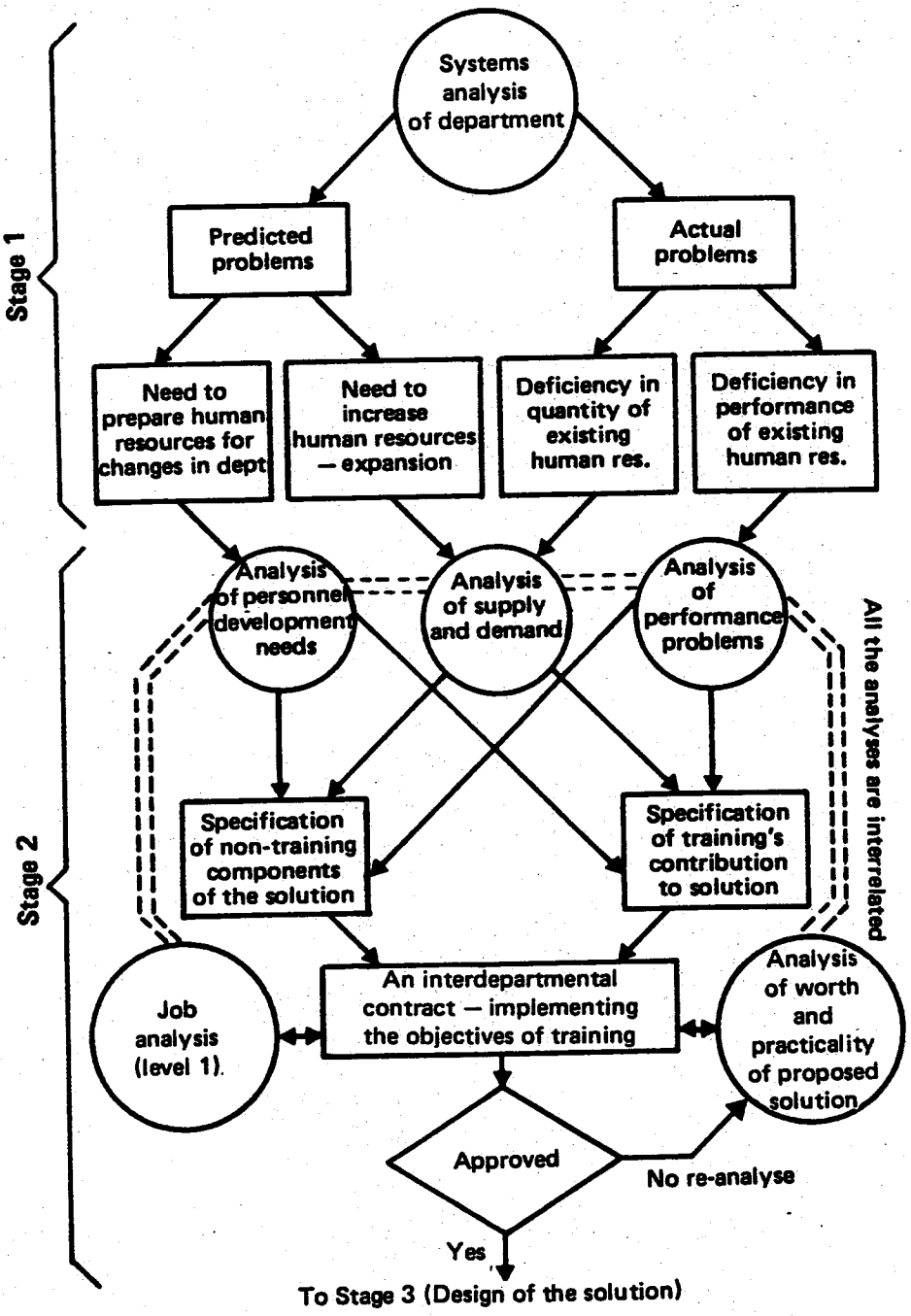

Figure 6.16 *Systemic analysis of training (and other) needs*

Taking each of the three contributory factors in turn, we see the need to perform some further analysis before deciding whether training is required, let alone the type of training.

Performance problems

1. *Analysis of performance problems (discrepancies).* Poor on-the-job performance at any level in the organization may have many causes, other than a lack of knowledge and skill. Therefore there may be many other solutions appropriate, other than training. Some components of non-training solutions are:
   - ☐ Selection of a different category of person
   - ☐ Improved supervision
   - ☐ Redesign of the job
   - ☐ Modified working conditions
   - ☐ Modified job-reward systems
   - ☐ Improved on-the-job information exchange.

   We have already discussed performance problem analysis in detail earlier on in this chapter (see Figures 6.12 and 6.13).

Supply and demand

2. *Analysis of supply and demand.* When in stage 1 the problem is identified as primarily one of quantity, it is necessary to analyse *why* there are difficulties in obtaining sufficient numbers (or why we may anticipate difficulties). Taking the job as the system of interest, one needs to analyse the current or proposed human resource inputs in terms of the criteria one should apply in selection and the availability of such personnel on the labour market. This must consider both job requirements and external constraints, such as other similar organizations looking for the same type of human resource (and possibly offering more attractive conditions). So we need an analysis of the job in terms of the conditions it offers, both within the job and within the organization as a whole. Is the job as interesting to do as it might be? Are general working conditions as good as they might be? How about industrial relations and social services? How about the rewards, both financial and status? How does the job compare with similar ones on the market? How does it match up to the general social status aspirations of the type of person required to do it? As Figure 6.17 suggests, all these factors interact with each other. Only by considering them as a total system can one identify to what extent training would form a part of the solution. Training plays its part in cutting the time needed to reach 'experienced worker standard', in cutting frustrations and errors on the job, in reducing the minimum selection criteria, and so on. But training is seldom the total solution (and what training to use is yet to be determined).

Personnel development needs

3. *Analysis of personnel development needs.* Changes or growth in the organization bring about a whole variety of needs for changes in the knowledge, skills and attitudes of existing staff, as well as possible needs for an expansion of existing staff. Whereas the aspect of new staff should first be tackled by a supply/demand analysis, the aspect of existing staff requires a consideration of the training and/or education that existing staff will need. We say education, as this aspect of the problem often requires some changes of attitudes, or simply information about the proposed changes, as well as specific job-related training or on-the-job experience. It is here that one may identify the need for orientation or appreciation courses/seminars which are not strictly speaking 'training'. They are 'browsing in the fields' as opposed to 'following the path'. We shall refer to this mixture of training and education for the future as development. One may require to develop a man to prepare him for:
   - ☐ promotion within his department
   - ☐ changes in the organization of his job or his department
   - ☐ changes in technology or in methods/techniques – changes due to growth of a department.

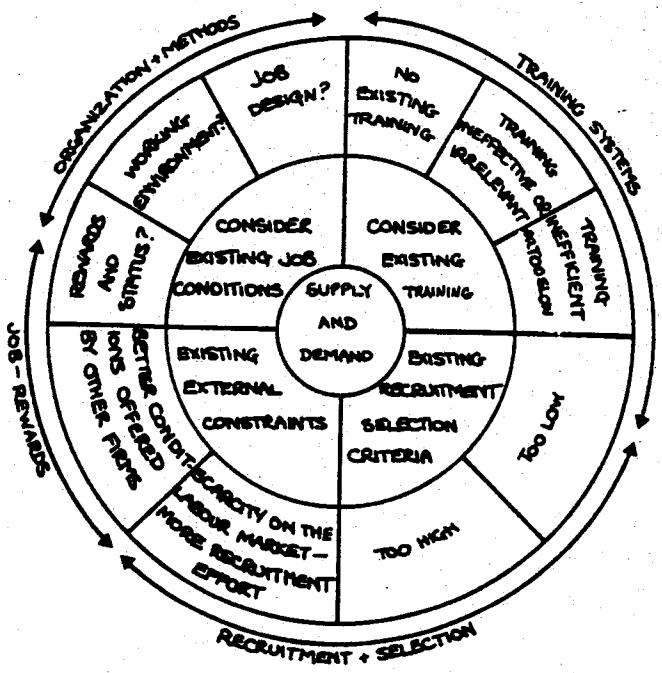

Figure 6.17 *Schema for analysis of supply and demand*

Figure 6.18 attempts to illustrate the complex, integrated nature of these factors. For example, a change in the technology/products could imply promotion for some, retraining for others, increased responsibility for yet others, and changes in organizational structure for all.

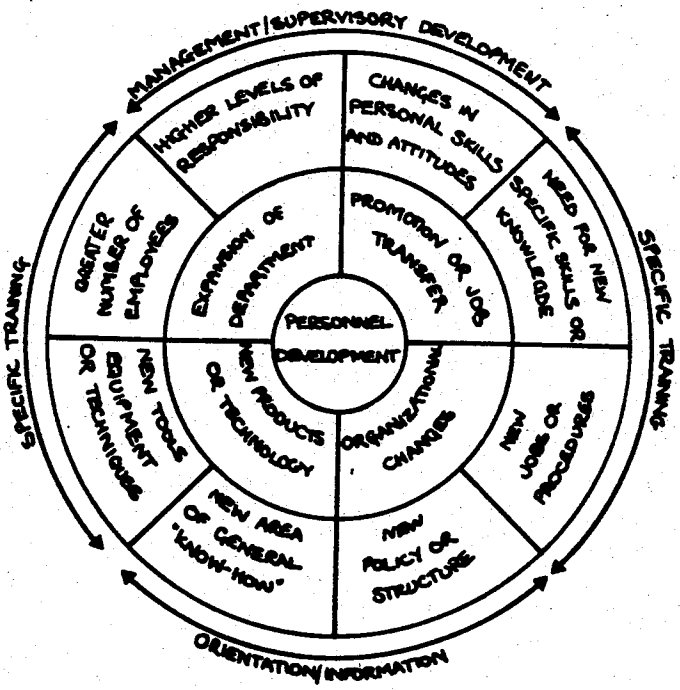

Figure 6.18 *Schema for analysis of personnel development needs*

Define overall project objectives

The extent and depth to which one would need to perform the three types of analysis described here will depend on the characteristics of the problem under study. These analyses are but steps to the specification of useful training objectives. The final step of stage 2 attempts to define these objectives.

Naturally, all of stage 2 should be performed by interaction with the

persons concerned, the management and supervision staff of the department concerned, the job performers (if they exist) and so on. But not all information will exist in the department (for example, supply/demand information may have to be sought outside the organization).

However, the last step in stage 2, the determination of what training, *must* be performed in conjunction with the department. It should be seen as a sort of contract:

- A successful solution to the problem involves other factors as well as training, therefore
- All these factors should be tackled in a coherent, integrated way, so that
- The final solution will be a combination of several actions, among them training, so
- The objectives of the training to be developed are conditional upon other actions also being performed successfully, and . . .
- These actions are the responsibilities of other departments/services/individuals in the organization, so
- We should establish, jointly, objectives for the various components of the solution and work as a team to develop it, so
- We shall distribute responsibility for achieving the objectives as follows, and
- We shall have regular review meetings to monitor and evaluate progress.

In other words, the end of stage 2 lays the groundwork for a management by objectives approach to developing and implementing the solution, which by now has been sketched out.

Thus, the overall training objectives will be set jointly by training designers and the 'clients' in job performance terms, more or less as follows:

Given the following conditions for viability (to be achieved by other non-training actions):	The training department will provide a flow of persons capable of performing the following tasks:	To the following standards of: ☐ productivity ☐ quality ☐ speed, etc Flow criteria ☐ So many per year/ month/week, etc

If this is done, subsequent job performance evaluation of training is simply a question of comparing actual performance to the predetermined standards and checking against the conditions for viability to identify the probable sources of poor performance. The statement also gives the training designer clear indication of overall training objectives, both in quality and quantity.

Stage 3: the development of the training

The third stage involves the preparation of concrete proposals for the training to be developed, and once these are approved by management or client the development of the training system.

This is now the specialist task of the training department, and is dealt with fully in other chapters (in this book and in Volume II). The process is presented here in summary in Figure 6.19. Note that before launching into expensive training development an overall training proposal should be submitted for approval to those who will be paying the bill.

The end of stage 3 is marked by the existence of a fully validated training system, ready to be implemented on a regular and large-scale basis. By now any other actions of a non-training nature (that were specified in the contract which closed stage 2) should also have been taken. Only then are we really ready to pass on to stage 4: full-scale implementation.

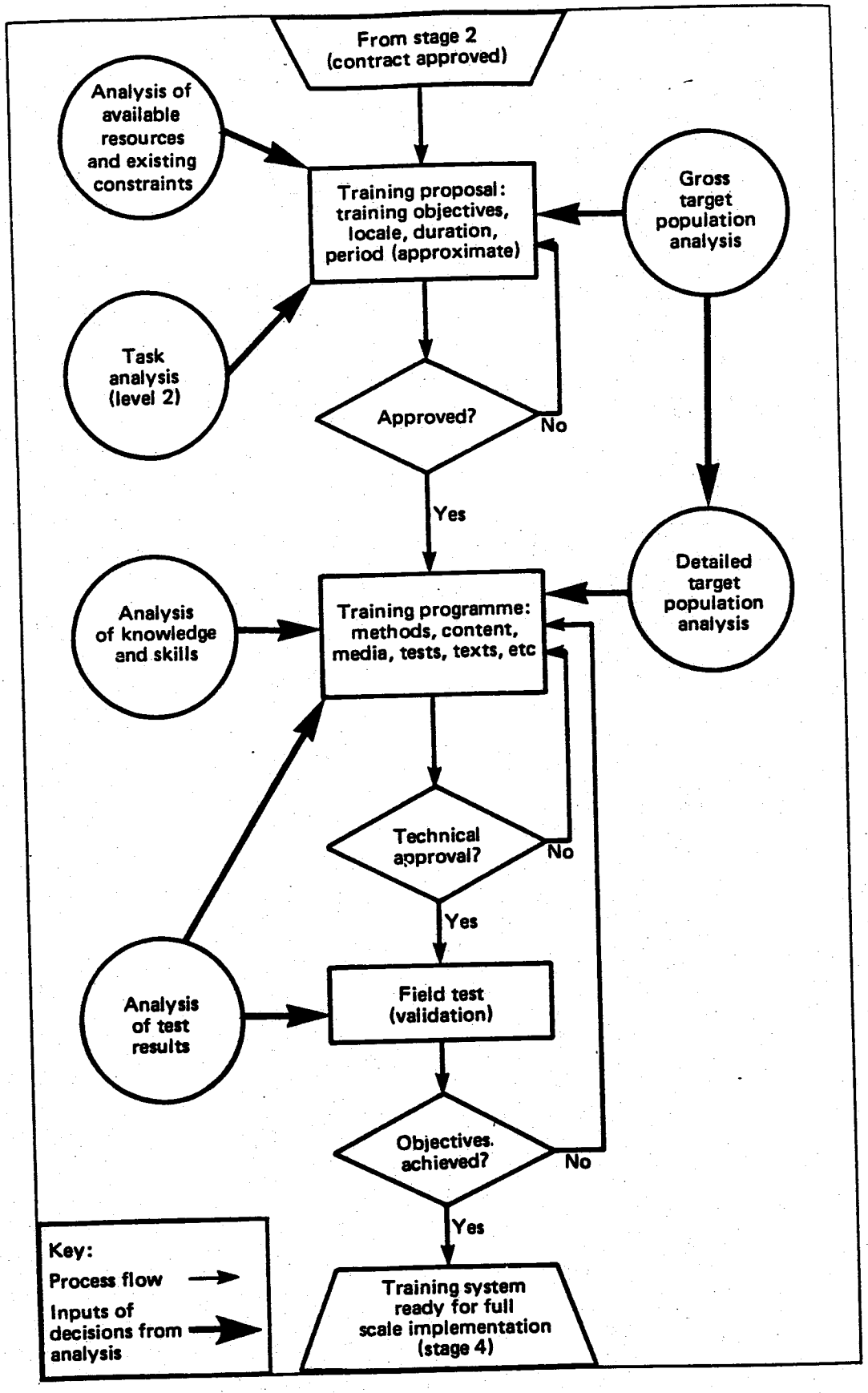

Figure 6.19 *Developing concrete proposals for training*

Note finally that the stages in this model are following the five-stage model of the systems approach outlined earlier. Stage 5 will be the full-scale evaluation of whether the originally diagnosed needs have been satisfied. This will be done through a job performance evaluation system.