## Developing a FAST diagram

This extract is adapted from *Value Management: Cost Reduction Strategies for the 1990s* (pp13-19, 77) by Eric Adam and describes the creation and costing of a FAST diagram.

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The group then makes use of an essential value management tool known as a FAST diagram. This name is the acronym for Functional Analysis System Technique and is a diagram which sets out the listed functions using a systems technique. The following diagram is an example of a FAST diagram which shows the functions of a value management team.

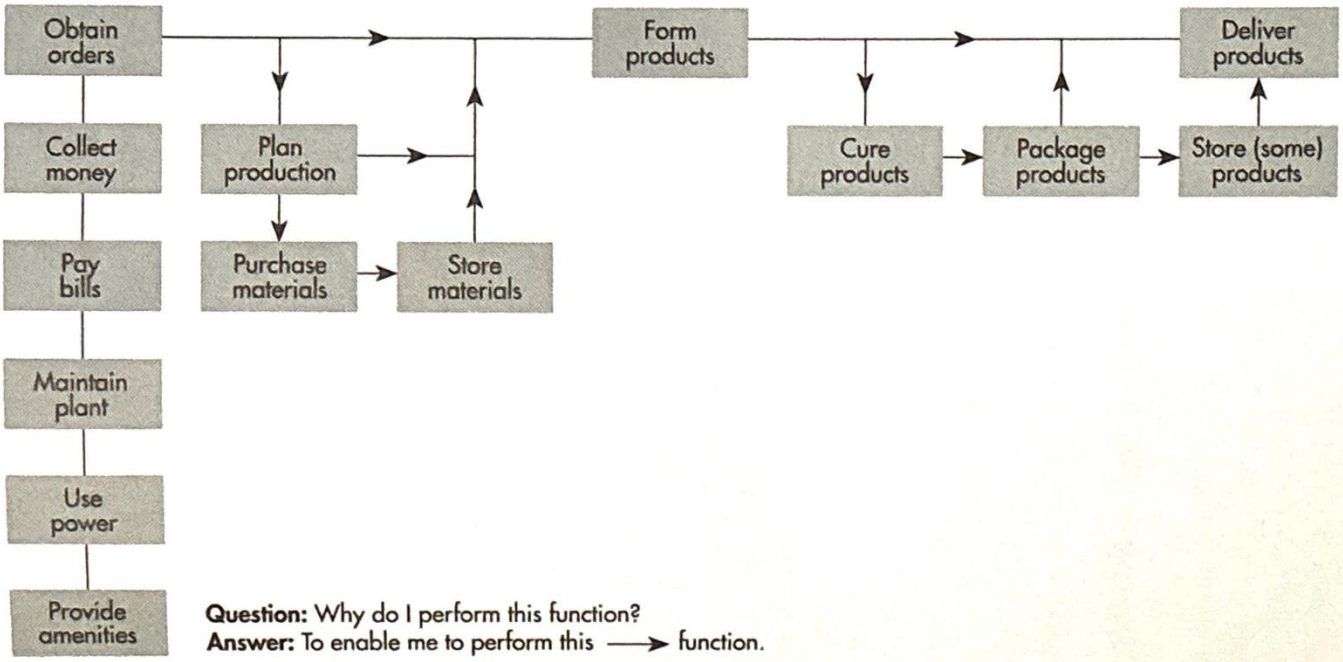


**Figure 1.3** Function Analysis System Technique (FAST) diagram of AB Concrete Block Co.—What does it do now?

The following diagram is an example of a FAST diagram developed from the list of functions of AB Concrete Co [the fictional subject of the ongoing examples throughout the book].

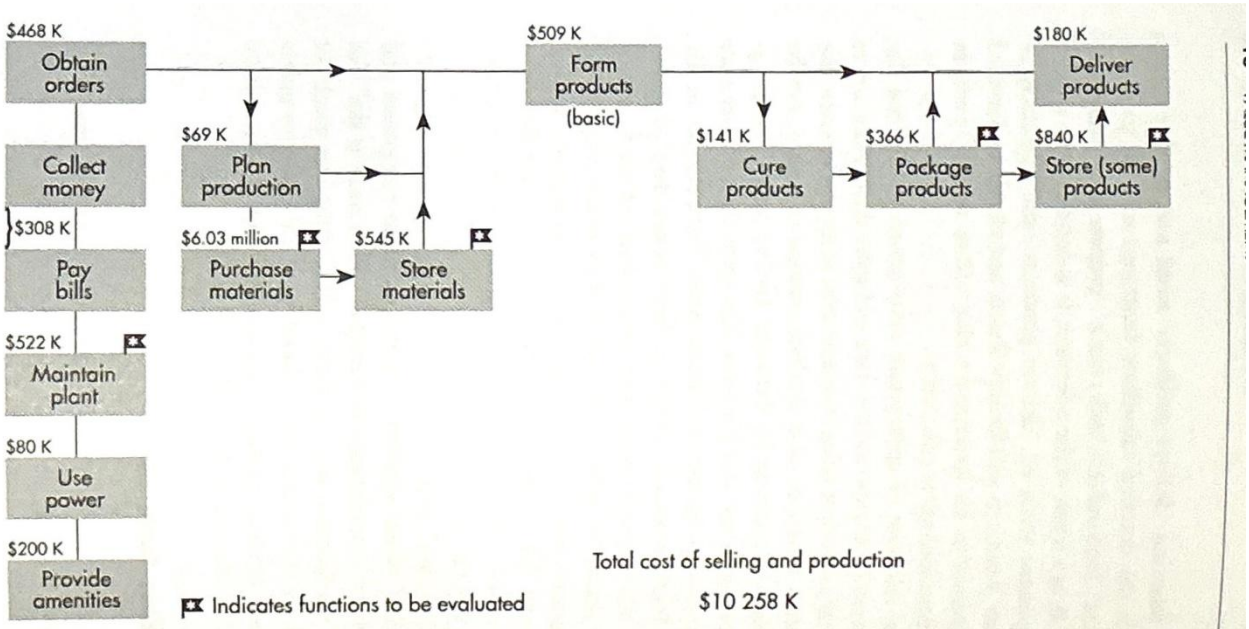


**Figure 1.4** Costed FAST diagram, AB Concrete Block Co. showing the cost of performing each function (basis of costing from Chapter 4, Table 4.2)

In the example which we are considering, the general management and the departmental managers, with some guidance from the facilitator, then develop the list which describes, in verb-noun language, the significant functions of their organisation. Each of the verb-noun functions are then entered on to a slop of paper and assembled in a FAST diagram, which will answer the question *What does it do now?* in terms of functions. It will also show how the functions are related, using the test of *Why does it perform this function?* for which the answer should be apparent on the diagram – to perform the next function to the right. The diagram will have a critical path of functions along the top, with supporting functions at lower levels.

At this stage it is important to list only the significant functions, and in this regard, a good facilitator or a person who has had previous value management experience can guide the team. The tendence is for an inexperienced team to go into too much detail and list too many functions, which then leads on to a very complex and unmanageable FAST diagram. For example, a team considering the significant function *deliver product* need not, at this stage, include the detailed subsidiary functions such as *pick out products, load pallets, order truck, prepare paperwork,* and so on. If, as a result of the overview, it is decided to do a value management study on *deliver products*, the subsidiary or satellite functions will then be listed, and clearly understood as preparations for looking for alternative ways to perform these functions more efficiently.

The selection of appropriate verb-nouns to describe the significant functions requires care and some skill and is a very important aspect of value management. In my experience, the significant functions of a product, process or system can be described adequately by between twelve and twenty significant functions, and if a team lists more that twenty they are probably going into too much detail. For example, in the above list there are two items – *collect money* and *pay bills*. These are simplified verb-noun descriptions of the functions of the accounts department and, in this initial stage, some accountants regard the descriptions as inadequate or even superficial. But when they are listed as significant functions the team will be aware that there are many detailed functions which must be performed before it is possible to *pay bills* or *collect money*. If it is decided that this function should be evaluated, these satellite functions will be recognised and listed when considering the question *What must it do?* But unless the function is considered to be costing too much for the service it provides, and is therefore of low value, or unless it is known that is causing or has caused problems, there is no point in going into more detail at this stage.

***Costing functions***

Having developed the FAST diagram and having agreed that it describes the significant functions of the organisation, the next step is to calculate how much is being spent, on an annual basis, to perform each function. The team may or not be involved in this costing activity and will, in most cases, disperse at this point, on the understanding that they will meet again…

It is normally difficult, if not impossible, to get from the accounts department the annual cost of performing each of the functions which the team may have listed, because of the way in which the company costing and accounting records are presently maintained. Even if it is possible to extract the relevant figures, it would probably take many days to obtain the information. It was for this reason that I developed simple but reasonably accurate methods of costing FAST diagrams, and suggest the use of a cost visibility worksheet for this purpose.

**Table 4.4** Value management evaluation of functions worksheet (3)

| Function no. | Description | | |
|---|---|---|---|
| What are the components? | | | |
| What **must** they do? | | What do they cost? | Analytical phase category no. |
| Verb | Noun | What else will accomplish the function? | |
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| | | | |
| ... (Extend to suit) | | | |

For a management overview of the type we are considering it is explained how the functions will be costed by the facilitator or one of the team members. This costing is done … so that when the team meets again, the FAST diagram will have been costed, and the team will be able to see on the diagram answers to the questions *What does it do?* (functions in verb-noun language) and *What does it cost?* (for each function and in total).

As a check, the total cost of the functions should be found to be within 5 per cent of the corresponding actual annual or budget cost (see above diagram). A cost visibility worksheet showing how the figures were derived is also shown above.

***Identifying functions: deciding areas of study***

The team will be asked to decide *Which is the basic function of this organisation?* that is, by definition, the specific reason why the device was designed and made, or the particular skill around which the company was built. The basic function of an organisation can, if necessary, be identified by a simple test, using the list of functions. In a concrete block plant, such as the one used for the example above, the team would agree that many people could purchase material, store material and, in fact, perform all the listed functions except *form product* which they decide is the essential skill around which the rest of the business has been built. In other words *form product* is the heart of the business – the basic function.

Some of the secondary functions may be considered to be essential but if they are not the specific reason why the company was set up, they are not basic functions. Usually there is one basic function, sometimes two, rarely three.

The reason why it is necessary to identify the basic function is that the team should become aware that the cost of performing it is usually only about 10 per cent of the total cost. This means that for every $100 being spent, $90 is going to pay for secondary functions, and only $10 for the function for which the business exists.

In two power station studies in which I have been involved, only 11 per cent of the cost was used for the generators, which were installed to perform the basic function *generate current*. The considerable savings which were made on these projects were in the secondary functions. Many similar examples can be given. In some organisations the cost of maintaining the plant can be as high as the cost of the basic function, obviously unacceptable. In some companies, the amount spent to enable equipment to perform the basic function is under 5 per cent of the total cost. In such cases, what began as a simple concept has become too expensive because the cost of providing the selected secondary functions is too high. For example, an automatic electric toaster costing $40 has two elements, the replacement cost of which would be about $4. The basic function of *heat bread* is performed by the elements, but around these items have been assembled other items which perform secondary functions but which are causing 90 per cent of the cost. Although it is possible that a very small saving could be made by reducing the cost of the elements, the analysis of the secondary functions will enable the team to decide where to start in order to make maximum savings and reduce costs in the minimum time.

A costed FAST diagram will show as the next step those functions which are not 'good value' and which should be selected for further study. As the team examines the costed FAST diagram, they indicate those functions which they consider should be the subject of ·a more detailed evaluation by drawing, say, a flag above the box. It is usual for about six flags to be placed on a FAST diagram at this stage. A flag should not be regarded as criticism, but as an indication that the team consider that this function should be further examined for what could be a number of reasons. It is also usual that the sum of the costs of the flagged functions will amount to 80 per cent of the total. This is recognised as the Pareto principle and indicates that these are the functions which should provide the best prospect for savings or identify where to start. The team will then decide the order in which these functions should be studied, whether suitable staff can be made available for the time which will be involved for the workshop, and whether the flagged functions can be studied in groups or individually. Assuming that the departmental managers consider that three of the six functions should be the subject of a value management study, they will need to form teams for each project by nominating suitable people, preferably from different levels of the organisation and from different departments, and also, if possible, including supervisory level employees. In some cases, it may be advisable to include a union representative as a member of one or more of the teams.