AMQ International
Strategic Asset Management

Issue 33, April 7 2000

Special Focus Issue on
CAT-Comparative Assessment Technique,
What it is, and how to do it

Quantify the Unquantifiable

And change the way you

- **State goals**
- **Track performance**
- **Benchmark**
- **Evaluate**
- **Communicate**

The purpose of asset management is to improve outcomes.

It has therefore proved rather limiting that we have been unable to measure many of the outcomes we wish to improve. Until now.

A new technique, developed in the UK, takes qualitative outcomes and transforms them into user defined and accepted gradings that can be measured, monitored, and tracked over time. Now there is a way to determine whether qualitative outcomes are improving, whether goals have been reached. - and, if not, *how far* we are away from the desired end-state (and how much it will cost to get there!)

The potential of this new technique is so great that this entire issue of the newsletter is devoted to what it is and how to apply it. It is called CAT– Comparative Assessment Technique, and it is based on the simple, but operationally powerful, idea that any qualitative output can be expressed in terms of its worst state, its best, and all possible states in between.

Being able to measure qualitative outcomes/outputs makes it possible to

- Track developments over time
- Compare outcomes with other organisations
- Relate activities to outcomes
- Relate *the cost of* activities to the *improvement* in outcomes

Researched and written by Dr Penny Burns, AMQ International.
Published fortnightly. Subscription, Comment, or Inquiries to

AMQ Intenational
PO Box 75 Salisbury South Australia
Tel 618 8258 4342 Fax 618 8281 5795
Email: sam@amqi.com

So how is it done?

The CAT concept is simple. It relies on the fact that anything can be described in terms of its worst state, its best state and by as many other possible states between these two. Suppose we use as an example of intangible factors the difficulty in measuring the Cleanliness of a Reception Area.

We could list all the possible states, from worst state to best state, as follows: -

Ladder - Cleanliness of a Reception Area

1. The filthy nature of the area is seriously affecting our relationships with staff/clients.
2. We are always receiving complaints about how filthy the area is.
3. We often receive complaints about how filthy the area is.
4. We have had complaints about how filthy the area is.
5. Although we have not yet received complaints from staff/clients about the dirty condition of the area, we know that this is likely to happen.
6. We feel that as a company we are embarrassed by the dirty condition of the area.
7. We feel that staff/clients believe that the area is very often dirty.
8. We feel that staff/clients believe that the area is usually clean, but is often embarrassingly dirty.
9. We believe that staff/clients think that the area is almost always clean.
10. We believe that staff/clients think that the area is always clean.
11. We never have any problems with the cleanliness of the area.
12. We believe that staff/clients think that the cleanliness of the area is always excellent.
13. We are always receiving favourable remarks from staff/clients about how clean the area is.

No limitation on the number of steps to be used

Note that we have not attempted to limit the number of steps to ten; this would have been the natural tendency, but it is pointless and an artificial irrelevance to the definition of the states. The CAT term for this list is a ladder and each listed state is a step.

Setting Target Step

We can now designate the Target Step that the user and supplier agree should be met. Suppose this is Step 11. *We never have any problems with the cleanliness of the area.*

Setting Actual Step

The user and supplier can now select a step that matches the actual position at any one time. This is the Actual Step. Suppose this is selected to be Step 5. *Although we have not yet received complaints from staff/clients about the dirty condition of the area, we know this is likely to happen.*

Comparing the Two Steps

We can now obtain a measurement of the actual condition in relation to the target condition. This is given by: -

$$\text{Factor} = \frac{\text{Actual Step}}{\text{Target Step}}$$

$$= \frac{5}{11} = 0.45$$

Improving Communication Between Client and Contractor

Ladders such as this, especially if developed with joint input, have the potential for far better communication and understanding between client and contractor. It is possible for both to see clearly when a goal has not been achieved (with potential for service improvement) and *when it has been over-achieved (with potential for cost savings)*

Creating Numerical Values

Two interesting things become obvious from the calculation on the previous page.

- The first is that we now have a numerical value of something that previously could only be considered in subjective terms.

- The second interesting point is that although we now have a decimal value of the relative position of the actual state against the target state, we did not start with a scale of ten.

Note:

Any ladder can be of any length. In fact, the user and the supplier of the service determine the length by incorporating as many steps as are required to fully describe the activity.

It doesn't matter that the Target Step is not the top step of the ladder. Target Steps can be moved as new goals are agreed. Note also that there need not be equal increments between steps, although equal steps would be ideal.

The technique is not restricted to Building Services. **Ladders can be used to measure any activity in any one of a number of areas**. These areas are not limited to commerce or industry; Local and Central Government are also relevant**.**

CAT can be applied to the measurement of anything that is intangible.

Using CAT

What do you wish to measure?

In assigning CAT to an application area, it is helpful to consider what precisely is being measured. This may seem to be an obvious statement, but there is often confusion in this respect whether tangible or intangible measurements are required.

For example, do you wish to measure the performance of a group, or the results of their work? The two are not necessarily the same. CAT accommodates these more precise definitions of activities by providing for three types of ladder.

Three types of ladder

These can measure

- the performance of a task,
- the effectiveness (or result) of the task, and
- the consequence of the overall activity, e.g., what do the users think of the results?

These ladders can be used separately or in any combination in order to precisely define any activity.

Using Ladders in Combination

Ladders can be combined into groups – any groups that the user organisation feels are important to measure or compare. Also, the activities associated with ladders can have parent/child hierarchies so that, for example, measurements can be rolled up from individuals to groups, to departments, to sites, to divisions and ultimately to the overall company or organisation. In both cases, users also need to agree *the weights to be given to each ladder and activity*.

Ladders can also be used for comparison in benchmarking exercises. For benchmarking, it is necessary for user organisations to agree on the standardisation of ladders.

What Can CAT be Used For?

When CAT is applied to the Facilities Management operation of a business, it can contribute both to the effective measurement of the FM operation by its customers and to the measurement and control of the supplier organisations, such as maintenance contractors, by the Facilities Manager. The following description of some of the major components of a business illustrates where CAT fits in and operates alongside other measurement techniques.

Major Business Activities

Investment
- Supply Chain
  - Suppliers
    - *Image*
  - Customers
    - *Image*
- Operational staff
  - *Image*
  - *Comfort*
- Physical Assets
  - *Operational Effectiveness*
    - *Operational Efficiency*
    - Energy Efficiency
    - Fuel
      - Tariffs
      - Settings
      - On/Off Cycles
      - Levels
    - *Replacement/Upgrade*

Operational Methodology
- Personnel Policy
  - *Conditions of work*
  - *Timekeeping*
- *Work attitude*
  - *Career progression*
  - Business Structures
    - *Departmental roles*
    - *Section roles*
    - Work Areas
- *Health and Safety*
  - *Environment*
- *Comfort*
  - *Fabric*
  - *Access*
- *Security System*
  - *Doors*
  - *Vertical Transportation*
  - *Horizontal Transportation*
- *Catering*
- *Washrooms*

Communication
- *With customers*
- *With suppliers*
- *Internal*
  - *Vertical*
  - *Horizontal*
- Methods
  - Voice
    - Text
    - *Complaints*
  - *Procedures*
  - *Mechanism*

CAT can assist in the measurement of the italicised activities.
Where outputs can already be measured satisfactorily, such as energy efficiency, there is no need to apply CAT

Let us look at this table.

There are three occurrences of Image in the Investment column and they will probably not be identical. For example, the image that the organisation will want to project to its customers may be similar to, but not identical to, that which it wants to project to its staff. CAT can also cater for these subtle differences in objectives and their corresponding measurements.

If we now consider Image as projected towards the Customers of the organisation, we can break this objective down into factors that contribute towards the achievement of the desired image as follows: -

Image
- Cleanliness
- Fabric
- Operation
- Vertical Transportation (Lifts)
- Horizontal Transportation (Escalators)
- Doors
- Lighting
- Heating and
- Ventilation

Note that other items affect Image, but we are concentrating here on Facilities Management. CAT ladders can be applied to each of these areas to define the range of possible states. As we saw in the earlier brief description of CAT, these ladders may be of three different types. We have a *performance ladder* that measures how well a task is being carried out, an *effectiveness ladder* that shows the results of a task in relation to the target expectations, and a *consequence ladder* that measures the perception by the ultimate customer of the task or service.

If we consider just one of the factors that contributes to Image, say *Heating and Ventilation (HV)*, we can define ladders that measure the *consequence* of the HV activity to show its effect on the image as perceived by the customers.
We can also define ladders to measure the *effectiveness* of the HV operation, so that the Facilities Manager can measure how well his HV contractor has performed against his agreed target level.

Finally, we can define *performance* ladders that can be used by the contractor to measure the activities of his staff and which can also be made available to the Facilities Manager as an additional control measurement.

A possible ***consequence ladder*** for Heating and Ventilation **in the context of Customer Image** could therefore be as follows: -

1. Customers have refused to come to our offices because they are always too hot or too cold.
2. Customers are always complaining that our offices are always too hot or too cold.
3. Customers often complain that our offices are too hot or too cold.
4. We sometimes get complaints from customers that our offices are too hot or too cold.
5. We seldom get complaints from customers that our offices are too hot or too cold, but we suspect that they are being too polite to tell us and it may therefore be affecting business.
6. Customers never complain that our offices are too hot or cold, but we suspect that they are being too polite to tell us and it may therefore be affecting business.
7. Customers seem to be happy with the temperature of our buildings.
8. Customers sometimes remark that we always have our buildings at the correct temperature.
9. Customers often remark that we always have our buildings at the correct temperature.
10. We pride ourselves in operating our buildings at temperatures that improve our image with customers.
11. Our policy regarding the temperature of our buildings is seen by our customers as an important factor in their measurement of our image.
12. Other organisations use us as a benchmark for the contribution that control of temperature adds to our image as perceived by our customers.

The following may be a possible ***effectiveness ladder*** for Heating and Ventilation: -

1. We never achieve the target temperature output from our heating and ventilation plant.
2. We seldom achieve the target temperature output from our heating and ventilation plant.
3. The output temperature from our heating and ventilation plant varies widely from that which is targeted.
4. It is unusual for the output temperature of our heating and ventilation plant to achieve the target temperature.
5. The temperature output of our heating and ventilation plant often varies from the target level.
6. The temperature output of our heating and ventilation plant sometimes varies from the target level.
7. The temperature output of our heating and ventilation plant rarely varies from the target level.
8. The temperature output of our heating and ventilation plant never varies from the target level.
9. We have very few problems with our heating and ventilation plant.
10. We never have any problems with the heating and ventilation plant.
11. We are benchmarked by other organisations because of the effectiveness of our heating and ventilation plant.

The *performance ladders* that feed this effectiveness condition may be of several types, depending on how deeply the contractor or Facilities Manager wishes to monitor the contributing activities. The technique can be particularly effective in the measurement of Contractor Compliance, where it considerably simplifies the often difficult task of relating actual performance to that specified in the contract. We shall consider two simple performance ladders, to monitor *the performance of the maintenance staff* and *the performance of the maintenance plant.*

The ladder for ***performance of the maintenance staff*** will depend on the actual workforce and their situation. The following ladder is given as an example: -

1. Our maintenance staff believe that they are underpaid and do not like the working conditions, causing absenteeism, poor work and aggressive behaviour.
2. Our maintenance staff are aggressive, have a poor attendance record and attitude to work, and are inefficient.
3. Our maintenance staff have a poor attendance record and attitude to work, and are inefficient.
4. Our maintenance staff have are bad timekeepers, have a poor attitude to work, and are inefficient.
5. Our maintenance staff have a poor attitude to work, and are inefficient.
6. Our maintenance staff have a poor attitude to work, and are usually inefficient.
7. Our maintenance staff have a poor attitude to work, and are often inefficient.
8. Although our maintenance staff have a reasonable attitude to work, they are often inefficient.
9. Our maintenance staff have a reasonable attitude to work and are seldom inefficient.
10. Our maintenance staff have a reasonable attitude to work and are normally efficient.
11. Our maintenance staff have a good attitude to work and are normally efficient.
12. Our maintenance staff have a good attitude to work and are always efficient.
13. Our maintenance staff have a good attitude to work and are very efficient.
14. We are proud of the attitude and efficiency of our staff.
15. We believe that our maintenance staff are among the best in the business.

The ***performance of the plant*** could be split into several ladders that show the constituent parts of the plant and their relevance and performance in relation to the achievement of the Heating and Ventilation objective. We shall, however, try to keep the plant performance ladder as simple as possible in order to illustrate the application of the CAT technique to the maintenance activity. This simple ladder is as follows: -

1. The plant is old, is difficult to get to work properly and we are always taking it out of commission due to faults or for maintenance.
2. The plant is old, is difficult to get to work properly and we often have to take it out of commission due to faults or for maintenance.
3. The plant is old and difficult to work on, is unstable and we often have to take it out of commission due to faults or maintenance.
4. The erratic nature of the plant means that we sometimes have to take it out of commission due to faults or maintenance.
5. We have difficulty keeping the plant in commission because of its age, but we seldom have to take it out of commission during business hours, although we cannot ensure correct temperatures.
6. Although the plant is old and we have difficulty in keeping it in commission, we ensure that it is never out of commission during business hours, but the output temperature is erratic.
7. The plant is never out of commission, but we have difficulty in keeping it that way because of its age, and the output temperature is difficult to control.
8. The plant is never out of commission, but we have difficulty in keeping it that way because of its age, although the output temperature can usually be kept on target.
9. The plant is never out of commission, but we have difficulty in keeping it that way because of its age, although the output temperature is always kept on target.
10. The plant is never out of commission, it is relatively new, and we have few problems with it.
11. The plant is never out of commission, it is relatively new, and we have never had any problems with it.

Clearly, this ladder would vary depending on the actual age and condition of the plant. Users can thus construct the ladder to precisely define each possible step from the worst to the best condition so that accurate measurement of the target and actual states can be made. This ladder and other similar ladders could easily be fed from an organisation's maintenance management system.

Costing the Move from One Step on the Ladder to Another

Now activities can be devised to move the plant from an actual to a desired target state. Once costed, of course, the agency may wish to reconsider the target state. The ladders therefore can be used as a means of communication between management and the board or council.

In Summary

CAT ladders can emulate any activity in an organisation where each possible condition from the worst to the best can be described by simple but accurate statements.

Develop Your Own Ladders

The reader is encouraged to apply the technique to areas of his or her business that have proved difficult to quantify and explore the potential for CAT to improve its measurement and the communication of its state to other interested parties. Once the benefits of the technique have been established, actual implementation to cover the many intangibles in a business can be considerably facilitated by the use of the supporting CAT software and by a Web-based library of ladders, contributed by user organisations, which can be downloaded and modified by new users to meet their own specific requirements.

The CAT technique is simple but its impact can be profound. It handles difficult areas in language that anyone can understand, because the users define the language. It is only necessary for the supplier of the service and the user of the service to agree on the statements associated with each step, and this can be done in any language. Thus CAT provides the ability to improve supplier/user communication while at the same time eliminating any jargon. It provides an important service to all forms of business by enabling precise measurement of difficult factors that are important to monitor but which were previously measured in an imprecise and unquantifiable manner. CAT thus has the ability to considerably improve the competitiveness of user organisations.

Who can benefit from CAT?

Practically anybody who is dealing with intangible outputs or performances in some way. Organisations such as the water industry or the Universities that already have well developed benchmarking co-operation would find the CAT technique invaluable and take their work to a new level. Individual organisations can use CAT to track their own performance as they implement new procedures or change their organisational structures. They can also use CAT to monitor the work of contractors (in-house or external) and to report to management. The applications of CAT are virtually unlimited.

See over page for some of the many areas in which CAT may be applied

CAT Support

And the nice thing is that there is now well developed software support and those who are keen to get things started can probably negotiate some favourable deals for being in 'on the ground floor' and establishing ladders in new areas. Nor do they need to 'go it alone' for there is help available from advisors experienced in ladder development. See below.

Already CAT software is available and the website is under negotiation. Norm Eason, the past president of the British Institute of Asset Management, who we featured in the last issue, developed CAT and can advise. Write to him for advice on how to develop ladders and/or to get professional help in this area. Write to him also for information about CAT software.

2000 Rapier Software Limited
1 Hollywood Court, Hollywood Lane,
Lymington, Hants. SO41 9HD, UK
Tel/Fax: +44 (0) 1590 670129
email: eason@cix.co.uk

Application Areas for CAT and Use of CAT in these Areas

(There is no particular order and this list is nowhere near exhaustive. It's just a guide)

Social Services

State of property
- Cleanliness
- Fabric

State of individuals
- Health
- Attitude

State of care

Hospitals

Fabric
Ambience
Noise
Smell
Staff response
Staff attitude
Performance of effort
Effectiveness of effort
Consequence of effort

Railways

Fabric of stations, trains and track
Ambience of stations, trains and track
Graffiti of stations, trains and track
Noise of stations, trains and track
Cleanliness of stations, trains and track
Staff Attitude
Staff Efficiency
Performance of effort

Education/Universities

Fabric
Ambience
Graffiti
Noise
Cleanliness
Smell
Access
Staff attitude
Student attitude
Safety
Fire Risk
Vertical transportation'

Etc.etc.

Opportunities for existing Benchmarking Groups

Where industries have already developed close knit links for the purpose of benchmarking, such as in the water industry and the University facilities industry in Australia, they would be in an excellent position to take advance of the new capabilities that CAT offers.

And, of course *THAT REMINDER*!

July 30th is getting closer. If you are thinking that *MAYBE* you will get the time to enter the Competitions and you would like to share your experiences with other and help develop the field of asset management, then

TAKE A SHORTCUT

Email penny@amqi.com - tell me what you are thinking of entering and I will think of shortcuts to help you get to a successful conclusion without inordinate effort.