

Getting to the **Heart** of the Matter

HOW CASE STUDIES CAN HELP



"My advice to you, sir, is to speak the truth."

The Resident Patient

Attracting the readers' interest

The main audience for our value for money (VFM) reports – Members of Parliament, the media are busy people. If they are to read our reports we have to say something interesting – procedures or systems although important do not normally spark interest unless they have gone seriously wrong. What readers want to know is – what was achieved, what was the outcome, could it be achieved more cheaply, why did things go wrong, what could be done better.

Readers are more likely to be interested, if they can see the human element or can put the subject in some sort of context, and case studies can help do this.

What are case studies? In many respects they are a self contained story – they bring together facts in a easy to read concise way. For example a case study might explain how a particular type of health care was delivered, how a major defence procurement project was managed or how a grant to a company to promote innovation was spent and with what impact. Case studies can bring a report alive but they should not be cumbersome. They should be free of jargon, visually appealing and structured to attract and retain the reader's interest.

Case studies can contribute to our work in a number of ways: the single case from which a generalisation could be drawn; a series of reports on individual cases that establish generic audit issues for PAC to report, such as PFI and privatisation; and the selection of a number of cases in an examination to compare performance and draw out good practices.

What can case studies be used for?

Case studies are one of a number of techniques for exploring an issue and comparing results. This approach is best used when it would be difficult to quantify results – a census would be impractical or it would be difficult to extrapolate results from a sample (see the separate guide 'Taking a Survey').

We can use case studies in two ways.

Descriptive It can help to take one aspect of the programme or organisation and describe it in more detail. This can provide useful insight into how the programme is managed or to help the reader understand the main factors influencing costs or outputs or outcomes. This type of case study is usually called a **Case Example** (discussed in part 1).

Evaluative These are case studies in the truest sense (part 2) in that they are used to form judgements on why things happened in the way that they did and to make recommendations for improvements. Throughout this guide these are referred to as **Case Studies** and they can take various forms

- **Exploratory** – as a diagnostic tool to help pose the questions which the full study should address (part 3)
- **A Source of evidence** during the full study to form judgements on performance (part 4)
- **Source of recommendations and financial savings** Case studies can be good at showing how our recommendations might be implemented (part 5)

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Part 1 Case examples



Sherlock Holmes was rubbing his hands and chuckling as he added this bizarre incident to his collection of strange episodes. "Your experience is, so far as I know, perfectly unique" said he.

A case example refers to:

The description of a selection of incidents, events, transactions or items in order to illustrate the findings and conclusions of a VFM report.

Two key words in the definition above require further explanation:

- **Selection** – the cases are chosen by judgement. As a consequence, the cases do not comprise a statistically representative sample.
- **Illustrate** – the cases depict a particular finding or conclusion. Such examples should not infer or demonstrate that the results are applicable elsewhere.

This part of the guide outlines the benefits and drawbacks of using case examples, important points to consider in using the techniques, and some good practice examples of how to present case examples in reports.

Benefits and Drawbacks

There are a number of benefits to using case examples in a VFM examination:

- **PAC interest.** The PAC Chairman welcomes examples in NAO reports. While the main evidence of a report will need to be more substantive, examples enable PAC members to understand issues quickly and to question witnesses more on the tangible impact and consequences of the topic.
- **Clarity.** Examples can 'bring a report to life'. The technique helps the reader to understand the full implications of what the report is saying.
- **Cost.** Case examples can be a relatively inexpensive technique. The approach is usually straightforward – the various sources are often in one location – and analysis mostly involves summarising key events and actions.



There are also, however, a number of drawbacks to case examples:

- **Inability to 'generalise'**. Any findings from a case example are not applicable elsewhere. There is insufficient evidence to demonstrate that a financial saving in one case, for example, can be achieved from other similar cases.
- **Bias**. Case examples may bias a final report. We need to ensure that the final report incorporates a broad spectrum of examples, including those cases that describe good and bad practices.
- **Clearance**. Case examples can be difficult to clear. Departments will often want to check details with the individuals involved in each case example and we may need to seek approval from third parties. While case examples may receive high media interest, this is likely to mean greater client sensitivity and, therefore, we need to build additional time into the clearance stage to deal with this.

Points to Bear in Mind

There are three key areas we should consider when we plan to use case examples: the selection strategy; data collection; and clearing the facts with the client department.

Pick your cases carefully

However robust and effective the techniques used to examine each case, if we pick the wrong examples, the results are likely to be difficult to clear with departments. The key steps are:

- **Know your field**. Whether you want to select a sample of cases that show how something has gone wrong, good practice examples or a broadly



"But if I have hit upon the true explanation of this one small phenomenon, then in an instant the case rises from the common place to the exceedingly remarkable."

The Adventure of the Abbey Grange

representative set of examples, it is important to know the main types and characteristics of the cases you want to select from.

- **Pick the right cases.** Random samples may not be appropriate. A statistical sample requires a minimum of around 30 cases, but we usually require a smaller number of case examples. As a consequence, a small number of cases selected randomly may result in certain types or category of case being missed. Instead, good practice involves defining factors we wish to examine, (such as good and bad practices, or regional and headquarters based cases) and selecting cases from each category.
- **How many cases?** Unless you plan to select a statistically representative sample, recent VFM reports suggest ten to twenty cases are sufficient. While the selection strategy (see above) should determine an approximate number, other factors to bear in mind include the complexity of each case and whether the cases are likely to be sensitive. You may wish to add in some additional cases in the event that some 'fall by the wayside' during clearance.

Use the right techniques

Each case example should be treated as a microcosm of a typical VFM examination. As a consequence, a variety of techniques may be applicable (see the VFM wall chart). Important points to consider include:

- **Consistency.** Data collected from each case should be consistent. Good practices include developing a checklist and briefing VFM colleagues beforehand.
- **Extent of evidence.** Consider how each case will be presented in the report before commencing data collection. It is easy to be 'sidetracked' when collecting evidence on case examples. Individual cases often generate

Getting to the **Heart** of the Matter

The Scotland Yard inspector was still writing in the parlour when Holmes interrupted him. "I understand that you are writing a report of this case," said he. "So I am". "Don't you think it may be a little premature? I can't help thinking that your evidence is not complete."

The Adventure of the Norwood Builder



interesting information and may warrant additional examination time. But we need to bear in mind that the results are illustrative, and interesting data on a case may be difficult to incorporate in the final report.

Clearance starts early

Sensitive or critical case examples can be difficult to clear with departments.

Good practices include:

- **Agree the approach up front.** Agree the selection strategy and why we intend to use case examples beforehand.
- **Consult third parties.** When case examples refer to third parties (such as customers, suppliers or specific employees) it is important to seek their views. The VFM handbook offers advice on how to clear evidence with third parties.

How to present case examples in VFM reports

Case examples should be succinct, clear and informative. Good practices include:

- Keep each case summary short. A maximum of one page, ideally only one or two paragraphs.
- Ensure each case example stands clear of the text. Putting an example in a box or on a separate page helps the reader to recognise it is an example and does not have to be read as part of the report.
- Photographs or diagrams help the reader to recognise case examples in a report.

Our report on Managing the Millennium Threat II demonstrated how case examples can be used to illustrate the main text of the report – see figure 1.



Figure 1: A good example of how to present case examples

Case 1 The United States of America: Federal Aviation Administration Systems

The General Accounting Office reported that the Federal Aviation Administration's progress in making its systems ready for the year 2000 has been too slow, and that at its current pace it will not make it in time. The potential consequences included degraded safety, grounded or delayed flights, increased airline costs, and customer inconvenience.



Case 2 Shell UK: Gas and Oil Supply

Shell UK, giving evidence to the Science and Technology Committee, described some of the problems they faced in a typical offshore oil platform which uses up to 10,000 microprocessors, half of which are critical to the business. If Shell had taken no action there would be no environmental or safety risks, but the supply of gas and oil would be suspended. Shell UK are spending an estimated £40 million to ensure all their critical systems are compliant.



Case 3 Medical equipment in the National Health Service with embedded chips: Infusion Pumps

The British Standards Institute Year 2000 group has identified a problem with intravenous infusion pumps which give very accurate drug dosages to patients over a period of time. If these pumps are not recalibrated every six months they shut down as a safety device. At the year 2000, if the clock in the embedded computer chip is not year 2000 compliant, the equipment will assume it was last recalibrated 100 years ago and stop functioning. This could have serious consequences for patients.





Part 2 What is a case study?



The approach of the German war caused him however, to lay his remarkable combination of intellectual and practical activity at the disposal of the government, with historical results . . .

His Lost Bow

A case study refers to:

The examination of a representative selection of incidents, events, transactions or items in order to understand and measure a programme or activity as a whole.

Two key phrases require further explanation:

- **To understand and measure a programme or activity as a whole.**
The purpose of a case study is to 'generalise' the results, that is, to identify findings and conclusions, which are applicable to all similar cases.
- **A representative selection.** In order to generalise results, cases need to be representative. But as the cases selected are not statistically representative, our representative selection should be based on a rational and reasonable method of selection.

This part of the guide explains the main benefits and drawbacks of using case studies compared to using case examples or picking a statistically representative sample of incidents. The two subsequent chapters cover how we might use case studies to design studies (see Part 3), and how we might use case studies during a full VFM examination (see Part 4).

Benefits of case studies

The main benefits of case studies are:

- **Financial savings.** Examining the detail of a case can be a useful method of identifying financial savings – see figure 2. There is often greater time and opportunity to examine a case, compared to a sample of incidents (case studies infer examining a small number of incidents in depth, while statistical samples usually involve examining a large number of incidents in



less detail). And any recommendations from a case study likely to lead to a financial saving can still be generalised to cover all similar cases.

- **Cost.** Examining a small selection of cases is often cheaper than examining a much larger representative sample.
- **Accuracy.** Careful planning of a case study methodology can reduce the risk of mistakes. The case study approach recognises the wider context around each case and what impact these external factors have.
- **One Way of Examining Large Topics.** Don't ignore a potential examination simply because it may appear too difficult to address. Large topics such as welfare to work, or freedom of information might be possible to examine by using case studies. The annual Major Projects Report uses a case study approach to examine project management by the Ministry of Defence.

But if you are going to use case studies, take account of the following:

- **'Up front' work.** Case studies require careful planning before fieldwork can start. Such 'up front' work can take time.
- **'Judgemental'.** Case studies necessitate a number of judgements by the VFM team. Unless the rationale is explicit and justifiable, clearance can be difficult.
- **Risk of inconsistencies.** Case study examinations are an iterative process – theories and models are revised as information is collected. As a consequence, the work cannot be broken down readily between team members at the outset. All team members need to understand the purpose of the case studies and to communicate regularly in order to ensure the data collected are relevant and accurate.



Figure 2: In depth case examinations can be a useful source of impacts

Estimate of savings arising from alternative disposal action

Tucano Trainer Aircraft

The Department recommended the sale of 15 Tucano aircraft in April 1996 based on a formal Investment Appraisal. However, the National Audit Office consider that in the light of earlier Departmental appraisals, the forecast need for Tucanos until 2010, and current assumptions of aircraft fatigue, the Department could instead dispose of up to 30 aircraft without placing the training task at risk. Savings have been calculated on the premise that:

1. A further 15 aircraft could be sold.
2. Essential modification work would be avoided for 15 more aircraft.
3. Storage costs would reduce had the Department acted more quickly as illustrated in Part 4 of the Report.

1. Increased volume of sales	30a/c @ £0.25m ⁽¹⁾	£7.5m
	less 15a/c @ £0.25m ⁽¹⁾	£3.75m
		saving £3.75m
2. Fewer modifications	30 a/c @ £38,760 ⁽²⁾	£1.16m
	less 15 a/c @ £38,760 ⁽²⁾	£0.58m
		saving £0.58m
3. Shorter storage period	30 a/c @ £42,218 ⁽³⁾	£1.27m
		saving £1.27m
		Sub total saving £5.6m

Gazelle Helicopters

As a result of the introduction of the Defence Helicopter Flying School, 75% of the Gazelle fleet have been declared surplus and available for disposal. Rather than undertaking a spares recovery programme as originally intended by the Department, the National Audit Office consider that a higher level of return could be achieved through disposal by sale.

1. Sale instead of spares recovery	50 a/c @ £150,000 ⁽¹⁾	£7.5m
	less 50 a/c @ £100,000 ⁽⁴⁾	£5.0m
		saving £2.5m
		Sub total saving £2.5m



Hercules Tankers

The Department declared four Hercules aircraft available for disposal and the DSA have commenced marketing work. However, as a direct result of not undertaking restoration work to the aircraft, the Department may have lost the opportunity to maximise the sales potential of disposal.

1. Sale following restoration work	Sale revenue ⁽¹⁾	£8.00m
	Less cost of restoration ⁽¹⁾	£0.2m
	Less sale revenue without restoration work ⁽¹⁾	£6.0m
		saving £1.8m
		Sub total saving £1.8m

Total Savings	£9.9m
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Source of Data:

Note 1: Estimates provided by Disposal Sales Agency.

Note 2: Estimates provided by Tucano Support Authority.

Note 3: Estimates provided by storage facility.

Note 4: Estimates provided by Helicopter Support Authority.

Note 5: The figures used for sale revenues for all equipments are based on estimates provided by the Disposal Sales Agency, which in turn are based on current market conditions. In some cases, market values may vary for individual equipments and the revenue achieved may be lower than estimated. In the case of Gazelle, should the sale value fall below £100,000 per aircraft the Department would opt for spares recovery instead of sale.

Part 3 Study design

using exploratory case studies





"That then, should be the centre of my search. From there I should explore every hut upon the moor until I lighted upon the right one."

Dr Watson – The Hound of the Baskervilles

An exploratory case study means:

A brief examination of a selection of incidents, events transactions or items in order to identify key questions for a subsequent VFM examination of a programme or activity.

The purpose of an exploratory case study is to examine a selection of cases in sufficient depth so we can understand how an activity operates in practice. The overall approach is one of theory building rather than theory testing. As a consequence, the general approach is to start with an 'open mind' – no plans or checklists that will restrict subsequent analysis.

Such an approach is not always practical in our VFM work. Exploratory case studies are most likely to be of use during study design, and by then we might have developed already some ideas on the scope and focus of the proposed VFM examination.

Yet some of the basic concepts and approach to exploratory case studies can be applicable to our study design work. And this part of the guide explains when it might be appropriate to use this technique during study design and the key steps in how we might go about such work.

When it might be appropriate to use this technique

Exploratory case studies can be a useful technique for developing key questions in order to focus the full examination. In depth examination of a case should generate sufficient insight for us to develop informed and specific questions for the subsequent full study.



But the technique is not always appropriate. Exploratory case studies can be an expensive and time-consuming exercise. And there is considerable risk that, if the small number of cases examined at the design stage has a strong influence on the direction of the full examination, key issues could be ignored.

This section identifies a number of scenarios where it may be appropriate to use exploratory case studies.

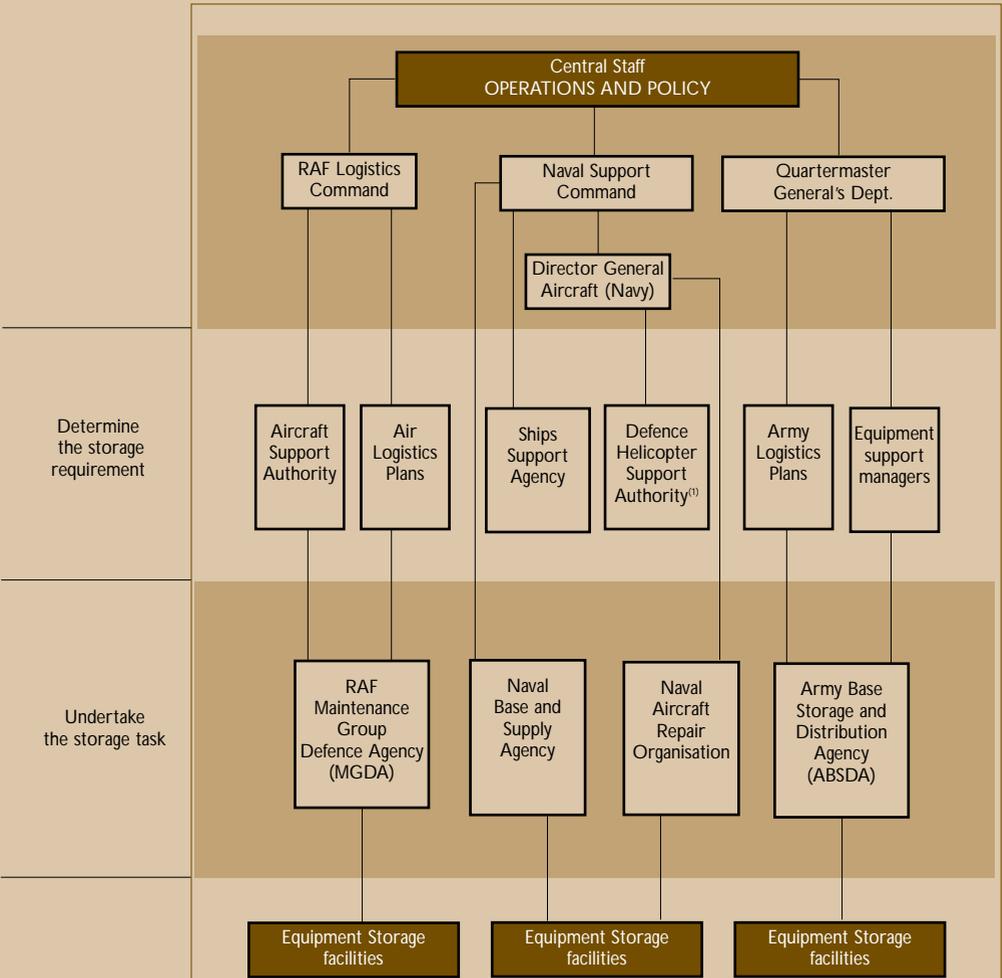
When an activity is difficult to define clearly

It is sometimes difficult to define precisely the key players, major decisions and outputs of an activity. While this will not be the case for most of our examinations, it can occur when:

- **An activity is not a major part of a department's work.** Where there is no clear link between an activity and the objectives of the organisation, it can be difficult to identify key players (such as senior managers), costs and outputs. The activity can cut across the organisational structure. For example, our report on Ministry of Defence: Major Equipment Storage [HC 1005 1997 –98] examined the arrangements for the storage of 204 aircraft, 9,166 vehicles and 19 Naval vessels. The storage task is undertaken by technical and stores divisions of each Armed Service plus outside contractors – see figure 3.
- **A major programme or initiative cuts across several departments.** Large-scale government initiatives, such as Welfare to Work, the introduction of the Citizen's Charter, and the Private Finance Initiative are difficult to examine as a whole – the programme involves collaboration between a large number of departments and agencies. VFM examinations are better designed to focus on individual cases.



Figure 3: Example of how our examinations can “cut across” a department’s organisational structure.



This figure illustrates the main areas of the Department dealing with storage.

Note (1): The Defence Helicopter Support Agency determine the requirement for helicopters for all three services.

Source: National Audit Office

“At the same time I recognise that the evidence is purely circumstantial, and that some new development may upset it.”

Silver Blaze



When collecting data on the entire activity is not cost effective

Limited time and monies during a preliminary study will restrict opportunities to examine performance across an activity as a whole. An exploratory case study is one technique for collecting sufficient information within such restrictions. Such an approach might be applicable when:

- **There are a number of regional offices.** Key players and information may be kept in regional offices. When there are a large number of such offices, for example the Benefits Agency, it might be more cost effective to restrict visits to a small selection of offices – see figure 4.
- **Access to source data is difficult.** Core data may be difficult to obtain where we have limited access rights. For example, where information is held by contractors, privatised companies or charities.

When our examination will focus on one case

Examinations that focus on one specific individual case will have to use an exploratory case study approach to study design. Examples include our reports on privatisation, Private Finance Initiative projects, and one-off construction projects.

Key steps in using exploratory case studies

The exploratory case study is a core technique in academic research; the approach is often referred to as ‘grounded theory’.

While none of our VFM examinations have adopted the concepts of ‘grounded theory’ in full, our study design stage can follow a broadly similar approach. For example, our report Department of Trade and Industry: Sale of AEA Technology [HC 618 1997-98] was a single case study of privatisation. And the study design



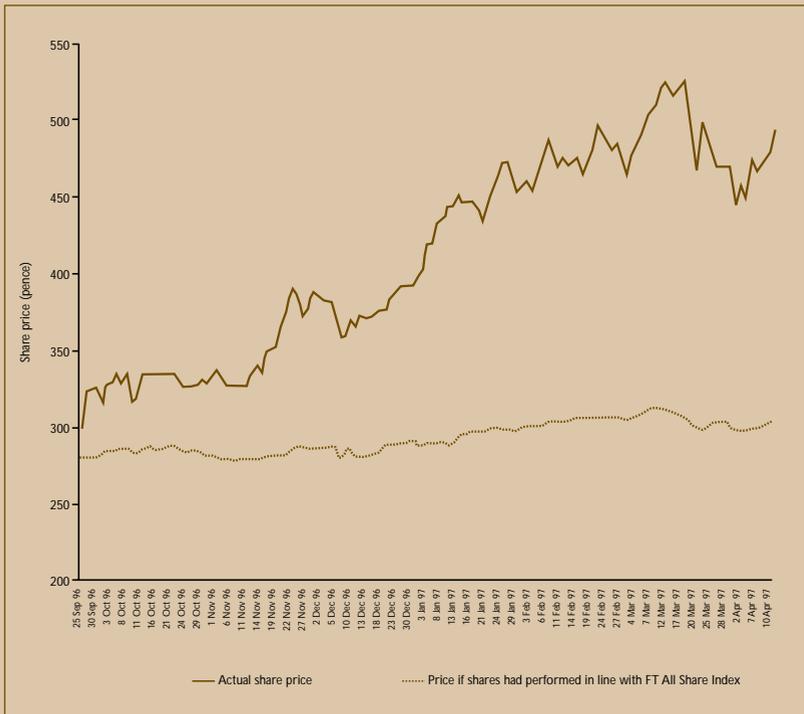
stage did incorporate elements of the ‘explanation building’ approach of grounded theory. The preliminary study report included a chronicle of key events and the development of a hypothetical model to compare actual price (post sale) with what the prices would have been if they had followed the average for the Stock Exchange – see figure 5.

Figure 4: Restricting fieldwork to selected sites is cost effective





Figure 5: An example of a hypothetical model develop to help focus key questions for study design



As a consequence of this explanation building, the study team identified two key questions for the full examination to address:

- Whether the price set for the sale was reasonable given the information available at the time.
- Whether institutions bidding for share could have firmed up their demand earlier (This would give a better and earlier estimate for the likely share price).



"... I shall approach this case from the point of view that what this young man says is true and we shall see whither that hypothesis will lead us."

The Boscombe Valley Mystery

The key steps to using an exploratory case study approach include:

- Plan the approach.
- Keep an 'open mind'.
- Identify common themes.
- Define the questions.

Each of these stages is explained in more detail below.

Plan the approach

It is essential to have some general framework of what you intend to examine and how this will be done.

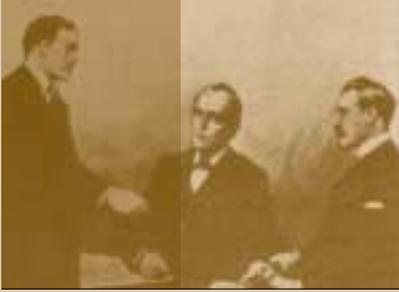
Key steps include:

- **Think carefully about how many cases to examine.** Time restrictions during study design will limit how many cases you can examine. As a general rule, it is better to examine one or two cases in depth rather than several cases at a more superficial level.
- **Pick your cases carefully.** The purpose of an exploratory case study is to develop questions. You might wish to select cases that demonstrate good practices, reasons why a case did not provide value for money, or cases that represent 'typical' performance.
- **Plan to avoid bias.** Qualitative techniques, such as case studies are prone to bias. Consideration of such bias and strategies to minimise the risks at this stage will help to ensure accurate results. The main risks are outlined in Figure 6.



Figure 6: Risk of Bias

Type of Bias	Strategies to Minimise the Risk
Exclusion of data	<p>Some exclusion is inevitable because of restrictions in the number of cases to examine. But risks can be minimised by:</p> <ul style="list-style-type: none"> • Know what you selected – by identifying the characteristics of each type of case; • Planning to use a range of techniques, such as interviews, file examinations and other quantitative techniques to collect evidence; • Mapping processes and decisions. A pictorial diagram can help to identify obvious gaps in the data collected.
Selective use of data	<p>Professional competence should minimise the risk of deliberate bias. But large quantities of fragmented and, perhaps, impressionistic information at this stage can easily lead to unintentional bias. Good practices to minimise such risk include:</p> <ul style="list-style-type: none"> • Brainstorming is useful as a way of ensuring all important data are identified. • Don't ignore inconsistencies. Encourage team members to highlight inconsistencies. If one case does not fit the pattern, the 'construct' will need to be amended. • Documentation of work. An accurate record of work done will provide a useful reminder for the team of what is important and it will enable reviewers to check for bias.
Inaccurate data	<p>Data gathered from a case study can be inaccurate or out of date. Triangulation – collecting evidence from different sources to support each conclusion – should minimise such risk.</p>



“Ah my dear Watson, there we come to the realms of conjecture, where the most logical mind may be at fault. Each may form his own hypothesis upon the present evidence and yours is as likely to be correct as mine.” The Adventure of the Empty House

Keep an ‘open mind’

The principles behind the collection of data and other information during an exploratory case study are the same as those for any VFM study design work.

But the underlying concept with exploratory case studies is that we should try to be ‘open minded’ throughout data collection. Good practice, therefore, is to adopt an iterative process to collecting information and developing theories and patterns. We must expect to discount theories and to revise models as work progresses. The one main danger with exploratory case studies is that it is easy to draw conclusions and conclude work too early; before assumptions and theories are sufficiently tested.

Identify common themes

The concept of developing a pattern or theory to match data collected is often referred to as explanation building. There is no simple step by step process to this task. The process can, perhaps, best be described as rather like developing a new car. The first model will reflect all the data collected. The model must then be tested and modified until we are happy the final product is the best we can achieve within the time and cost available.

Any explanation building relies on a clear and well-organised set of records. These records should include all sources of information, such as observation notes, interview notes and data from files and computer databases.

"Is there any other point to which you would wish to draw my attention?" "To the curious incident of the dog in the night-time." "The dog did nothing in the night-time."

"That was the curious incident" remarked Sherlock Holmes.

Sir Arthur Conan Doyle



Consider all the data collected carefully. Interpretation can require us to look at information in innovative ways – see box.

There are several approaches to developing patterns and theories:

- **Systems and procedural analysis.** Decisions and actions are documented according to the order in which the case is processed. Such an approach highlights responsibilities and actions, but it is difficult to put the case into context – systems and procedures are internal to a department, it is less straightforward to take into account external events (such as share price movements, the weather or political events).
- **Time Series analysis.** Time series analysis is essentially an analysis of the data over time. This approach does enable you to record key external events. It does not, however, identify relations between individuals or organisations and what impact these have on cost or quality.
- **Cause and effect analysis.** [Often referred to as the 'Paradigm Model' or 'Programme Logic Model']. Every government programme can be seen as an intervention – it is designed to produce a different set of outcomes than would otherwise arise. Cause and effect models refer to how the government intervention aims to produce its desired outcomes. Data collected during the exploratory case study is classified according to cause and effect relationships. Analysis would focus on what resources were required to generate an effect and then to compare the output of this effect with the desired outcome.



Define the questions

The purpose of exploratory case studies is to define specific detailed questions for a full examination.

Some general considerations that should apply to all questions are that they should:

- Address the concerns giving rise to the subject you are examining.
- Get to the heart of the matter.
- Be constructive.
- Be capable of being answered convincingly, and
- Be limited to a number of key aspects or issues; so as to allow focused and interesting reports, which add value.

Further advice on what questions to ask are in the guide on study design.



Part 4 Full examination

using evaluative case studies



The stage lost a fine actor, even as science lost an acute reasoner, when he became a specialist in crime.

A Scandal in Bohemia

The main benefit of using case studies rather than case examples (see Part 1) is to enable you to 'generalise' the results. This 'generalisation' is also often referred to as 'external validity'; it simply means that the findings of one case should be applicable to other cases.

While it is relatively straightforward to extrapolate the results of a statistical sample to infer something about the population, it is more difficult to generalise results from case studies. Past experience suggests that small 'judgemental samples' are difficult to clear with departments – they are reluctant to accept that the results can be representative of other similar cases.

But the case study approach is used in the scientific community. While it will often be difficult to adopt such an approach, it is possible, perhaps, to apply aspects of their approach to our own work.

This part of the guide shows how the scientific community can use case studies and the key steps to applying the approach to VFM work.

Using case studies in scientific research

Medical research is, like our own VFM work, a challenging and difficult process. Anyone putting forward a research paper on a medical topic has to be able to convince a very well informed and experienced audience. As a consequence, the purpose, approach and findings of each research paper should be well evidenced.

There are a number of good practices we might adopt from how medical professions use case studies – see figure 7.



Figure 7: An example of a medical research paper that relied on case studies for evidence

This is an abstract from the original paper. It provides a useful summary of the research project.

Drug resistant tuberculosis in prisons in Azerbaijan: case study

Abstract

Objectives: To document the existence of drug resistance in a tuberculosis treatment programme that adheres strictly to the 'Directly Observed Treatment, Short Course' principles and to determine the extent of drug resistance in a prison setting in one of the republics of the former Soviet Union.

Design: Case study

Setting: Central Penitentiary Hospital in Baku, the recovery centre for tuberculosis patients from all prisons in Azerbaijan.

Subjects: Prisoners with tuberculosis: 28 selected patients not responding clinically or bacteriologically to the standard treatment (group 1) and 38 consecutive patients at admission to the programme (group 2).

Main outcome measures: Drug resistance of Mycobacterium tuberculosis strains grown from sputum.

Results: All the non-responding patients (group 1) had strains resistant to at least one drug. 25 (89 per cent) of the non-responding patients and nine (24 per cent) of the consecutive patients had Mycobacterium tuberculosis strains resistant to both rifampicin and isoniazid. A further 17 patients in group 2 had strains resistant to one or more first line drugs.

Conclusions: Drug resistant M tuberculosis strains are common in prisons in Azerbaijan. Tuberculosis prisoners may have an important role in the transmission of tuberculosis, particularly on drug resistant forms, in the community. National programmes to control tuberculosis will have to take into account and address the problems in prisons to ensure their success.

The paper explains why tuberculosis is a problem in Azerbaijan. It includes sufficient contextual information for the reader to understand why the paper is important.

The objective is quite specific. The researchers were examining one particular issue – the extent of drug resistance to tuberculosis.

A case study approach was used. The paper specified how patients were selected and the examinations and tests carried out.

The paper identified one specific factor that would determine the extent of drug resistance.

By explaining clearly the approach used, the research paper can make more generalised conclusions for all prisons in Azerbaijan.



Using case studies in VFM examinations

The key steps to using case studies as a source of evidence for a VFM report are:

Define the task

Think carefully about what you are trying to establish. While case studies can be used for a number of purposes, it is always necessary to select some cases that can act as a 'control' – to compare the other cases against. You might use case studies:

- **To highlight good practices.** This involves selecting cases that have performed well and those of average performance. Differences in approach between the two types of case will identify the good practice.
- **To identify the reasons why an activity does not provide value for money.** We should select cases where performance was poor and similar cases where performance was better to identify the reasons why.
- **To demonstrate the impact of a specific action or event.** Where we have the opportunity, we might examine a case before and after the specified event or action occurred. Otherwise, we might try to select those cases influenced by the event and compare with other cases that were not influenced by the event.

Know what you want to find

Key tasks include:

- **Define the question.** Case studies are best used to examine specific questions. One approach might be to define the questions in a scientific way. For example, if we used case studies to examine the impact of an activity (such as payment delays), then the null hypothesis would be that the activity had no impact on the case. The alternative hypotheses would



be that there was some measurable impact. This method would clearly define the purpose of the case study and it demonstrates our impartiality – we have shown there are two possible answers (either the activity did have an impact or it did not). Where case studies are used to examine the reasons why an activity does not provide value for money, it is still important to define the questions – see figure 8.

Figure 8: A Good Practice Example of How to Define Questions for Case Studies

The Defence Evaluation and Research Agency: Review of Performance	
Criteria	Definition
Tasking/Setting the Specification	The efficiency of the procedures for tasking the Agency and the Department's ability to act as an intelligent customer in setting a clear and tight specification.
Pricing and Reasonableness of Costs	The Agency's performance in producing accurate and realistic cost estimates for work and the customer's ability to judge reasonableness and exercise commercial discipline to encourage the Agency to minimise costs.
Cost Control	The methods and systems used to ensure the outturn costs are as close as possible to original estimates, identifying reasons why cost escalation occurs and good practice in controlling costs.



"I only wished to ask a question," said Holmes, with his finger and thumb in his waistcoat pocket.

Silver Blaze

Criteria	Definition
Planning and Risk Assessment	The depth, detail and effectiveness of the Agency's project planning and risk assessment.
Milestone Delivery	Assessment of the case study assignments performance in terms of the timeliness of milestone delivery. Identification of the factors underlying good and poor performance.
Resourcing – Staff	The availability of appropriate staff resources to case study assignments and the factors leading to unavailability of, or conflict over, staff resources. Identification of any perceived long term risks to the availability or capacity of staff resources.
Resourcing – Facilities	The timely and affordable availability of suitable facilities to case study assignments and the identification of any perceived risks to the availability of facilities.
Impact of New Management Processes	The impact of new management processes and ISO 9001 on the assignments in terms administrative burden and perceived improvements in the quality of management and science.

The table shows the criteria that the National Audit Office used to assess the quality of the Agency's management of their scientific and technical work.

"Singularity is almost invariably a clue. The more featureless and commonplace a crime is, the more difficult is it to bring it home."

Sir Arthur Conan Doyle



- Identify the performance measure for each question.** Identify the specific factors that will enable us to answer the questions we set ourselves. For example, our report on the Crown Prosecution Service [HC 400 1997-98] examined the performance of the Service at the London Headquarters and five local offices. We defined a number of specific measures to assess the quality of the case files prepared by the Crown Prosecution Service. The measures included: the percentage of cases dismissed by the magistrate or judge before the defence is presented; and the percentage of cases rejected by the internal quality review system in each office.

Pick your cases carefully

Think carefully about which cases you might wish to select. There should be a clear rationale that explains why each case was picked that can be defended and agreed with the department before fieldwork starts.

Sometimes a single case is sufficient. For example, while a number of hospitals might be built or refurbished each year, our report Department of Health: Cost Over-runs Funding Problems and Delays on Guy's Hospital Phase III Development [HC 761 1997-98] focused on one specific project. This was because of the significant delay (three years and four months) to the project, and a funding gap of £26.8million.

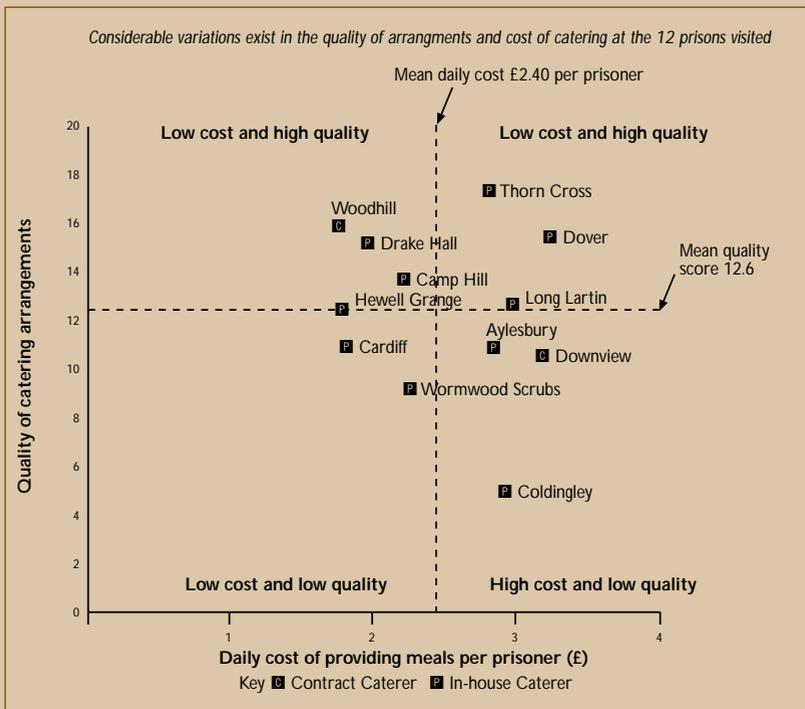
On other occasions, it might be appropriate to select a number of cases. Deciding which cases to select will depend on knowing what you want to find.

One option is to select a broad range of cases to demonstrate good practices or inconsistencies. For example, our report on Prison Catering [HC 277 1997-98]



included a judgmental sample of twelve prisons. Factors considered in the selection of the prisons included the geographical location; the security required in the prison; numbers of prisoners held; the types of prisoner held; and the catering arrangements. As a result, the report was able to demonstrate wide variations in the quality and cost of catering – which might be remedied by more uniform adoption of best practices – see figure 9.

Figure 9: An example of how case studies can demonstrate considerable variations in performance



“It has long been an axiom of mine that
the little things are infinitely the most important.”

Sir Arthur Conan Doyle



An alternative approach, such as might be used in scientific research, is to select specific cases that enable you to isolate those factors you wish to examine. Such an approach involves selecting a ‘test group’ (cases that include or were effected by the event or action under examination) and a ‘control group’ (cases that originate from the same conditions as the ‘test group’ but do not include or were not effected by the event or action under consideration) – see figure 10.

Figure 10: Using ‘control groups’ in case studies

Proof that Ecstasy Damages the Brain

Recent research has demonstrated that the drug ecstasy causes brain damage. These extracts from the research paper, published in *The Lancet*, shows how a case study approach using control groups provided the evidence.

We enrolled nine men and five women who reported previous heavy use of ecstasy (defined as more than 25 separate occasions). Recruitment was through advertisements (local newspapers and worldwide web) and referrals. Participants agreed to abstain from use of psychoactive drugs for at least three weeks before the study, and were asked to undergo drug screening before enrolment.

The control group consisted of nine men and six women who had no previous experience with ecstasy. After testing of blood and urine samples, exclusion criteria were: a positive drug screen; pregnancy; and severe medical illness. Participants were paid for taking part in the study. We obtained written consent from all patients.

A potential drawback of our study is that we relied upon participants’ reports of drug use and duration of abstinence. This is an inherent problem in all studies of illicit drug use. Our participants are unlikely, however, to have altered their drug-use history because they contacted us and identified themselves as ecstasy users. Drug tests indicated that no participant used marijuana in the 2–3 weeks before the study, despite several participants being regular marijuana users. Participants were told that they would not receive payment if they had positive results for psychoactive drugs. Knowledge of drug testing upon arrival was probably a good deterrent from drug use.



As Cuvier could correctly describe a whole animal by contemplation of a single bone, so the observer who has thoroughly understood one link in a series of incidents should be able to accurately state all the other ones both before and after. The Five Orange Pips

Possible ways of differentiating cases into 'test' and 'control' groups include:

- **Before and after situations:** Examining a case before the event and immediately afterwards might enable you to measure impact. Such an approach can only work when you can predict the time and date of the event with some accuracy. Examples might include planned events (such as a publicity campaigns or inspection programmes); known events (such as the new millennium); and procedural events (for example pregnant women will often undergo a programme of tests and health checks).
- **Comparative analysis:** You might compare the outcome from the first case study with the outcome of other case studies. All factors, except for the one issue we wish to examine should be constant. For example, we might send an identical application form to two different regional offices to assess whether they are consistent in processing such applications. Any differences in the final assessment will demonstrate regional inconsistency.

Make sure your case is strong

Case study findings should be correct and accurate. This requirement is often referred to as 'construct validity'. Remember, the technique is built around the concept of in-depth analysis of issues.

The range and applicability of techniques to case studies are the same as for VFM examinations as a whole.

Sources of information include:

- **Documentation** – the review of papers and correspondence. Analysis might focus on data recorded on such papers, or the processes and procedures applied to the documents (such as how long a document takes to be processed).

"My dear doctor, this is time for observation, not for talk."

The Red-headed League



- **Archival records** – such as computer databases. These are a useful source of evidence, although we might need to test their reliability.
- **Interviews** – essential to any case study. Interviews can be qualitative, such as one to one interviews or focus groups; or they can be more quantitative, such as opinion surveys.
- **Direct observation** – this might include a field visit, examining photographs or inviting a panel of experts to observe the activity.
- **Physical artefacts** – A final source of evidence is physical evidence – checking the final output of an activity. For example, our report Prison Catering [HC 277 1997-98], included a review of the quality of food at twelve prisons. One of the methods for assessing quality was to examine a cooked meal from each prison.

Quantitative and qualitative techniques might be used to analyse the data collected (see the wallchart on 'The VFM toolkit' for further advice on techniques). But, whatever techniques you might use, triangulation remains an over-riding principle. 'Construct validity' is strengthened by collecting and analysing data from different sources.

Keep a record of the judgements and decisions made

Case studies are a qualitative technique and, as a consequence, the methodology is inevitably subjective and open to question.

We must expect, therefore, departments and readers of our reports to question the decisions and judgements made. And we must have sufficient evidence to demonstrate that these decisions were objective and appropriate.



It is with a heavy heart that I take up my pen to write these last words in which I shall ever record the singular gifts by which my friend Mr Sherlock Holmes was distinguished.

The Final Problem

Good practice includes:

- **Justify the cases selected.** There should be a clear strategy for why each case is selected. This strategy should be explicitly agreed with the audited body at the outset. And the strategy should be clearly stated in an Appendix to the report.
- **Acknowledge weaknesses in the data.** The evidence from case studies is unlikely to be totally comprehensive and consistent. We should acknowledge where we know the data are unavailable or inaccurate.
- **Don't ignore inconsistencies in results.** Always investigate odd cases that do not fit the trend. Such investigations might identify the cases as outliers that can be discounted – in which case this should be explained. Or the inconsistent results may require us to amend our initial conclusions.

Report the findings

Case study results and findings should be incorporated in the draft VFM report along with other evidence. Results should, wherever possible, be supported by evidence from other sources. Such 'triangulation' of evidence will strengthen the impact.

There should also be a clear and succinct summary of the methodology. While providing access to the full details and results of experiments is characteristic of scientific research, such principles are not applicable to our work. But, the ability of readers to check whether the conclusions drawn from an analysis are justified increases confidence in these conclusions.



Medical journals, such as *The Lancet* and the *British Medical Journal* set out clear guidelines for their contributors; and we might adopt some of their good practices. In particular:

- **Set out the purpose.** Explain the questions set at the outset.
- **Define the outcome measures.** Specify what we were looking for. That is, what specific factors that would establish the answers to our questions.
- **Specify the total population.** What did we draw our sample from? Explain any assumptions or definitions used to define the population.
- **State the selection strategy.** Explain the rationale and approach to case selection.
- **Justify any changes to the original plan.** Any subsequent changes in approach should be acknowledged. For example, reasons why any cases were replaced or ignored in the final analysis.

Part 5 Making recommendations

and identifying financial savings



"Ha!" cried I, "if it is anything in the nature of a problem which you desire to see solved I should strongly recommend you come to my friend, Mr Sherlock Holmes . . ."

The Adventure of the Engineer's Thumb

Case examples and case studies can be a useful approach for developing recommendations and financial savings. In depth examinations enable us to identify good practices and, as a consequence, generate pragmatic and achievable recommendations.

This part of the guide sets out some common areas for recommendations arising from case examples and case studies and advice on how to use the approach to identify financial savings.

Common themes and topics for case examples and studies

Readers, in particular PAC members and the media, welcome case examples and case studies in our reports. But the approach can also help us to develop recommendations. There are a number of themes and topics where past experience suggests that case examples or studies might be appropriate:

- **Long term programmes.** Some programmes, such as privatisation, have been continuing for a relatively long time. Detailed examination of selected cases has enabled us to define good practices for the future. In particular, the recommendation that departments include a 'clawback' clause in each sale has generated a financial saving of some £115million.
- **Project management.** Case studies and examples can highlight problems that have arisen on a project. Good practices in management, contract negotiation and communication at an operational level on one project might be of help in subsequent projects.
- **Quality of service.** Case studies and examples enable us to examine an issue from the perspective of a customer. While opinion surveys and other quantitative techniques might suggest overall satisfaction with a service, case examples and studies might highlight specific concerns.



- **Inconsistent performance.** Case studies and examples can highlight inconsistencies between offices or functions within a department. Such comparisons can enable us to draw out good practice guides. For example, Our report on Prison Catering [HC 277 1997-98] identified significant variations in the cost and quality of catering at different prisons.
- **Strategic overview.** While the overall aim for a programme may be specified clearly, objectives set or individual cases may not be entirely consistent. For example, our report on the Forestry commission: Disposal of Forest Land [HC 688 1997-98] identified that the aggregated results of the different land sales did not represent the optimal selection for the estate as a whole.
- **Ad hoc activities.** Examination of individual cases may highlight an ad hoc series of activities without clear objectives or aims. For example, our report on The Management of Space in Higher Education Establishments in Wales [HC 458 1995-96] identified wide variations in space management and recommended that institutions give detailed consideration to space management issues in their estates strategies.

Maximising financial savings

Case examples can be a useful source of financial savings. Examining projects in detail can often lead to practical recommendations that are relatively straightforward to quantify.

But further potential savings are often 'lost' because departments will argue that such a case is a one-off and cannot be applied elsewhere. For example, our examination of The Management of Space in Higher Education Establishments in Wales [HC 458 1995-96] identified a recurring impact of £6.4million at two



institutions. Further savings may be achieved by a follow up survey of other institutions.

Using case studies rather than case examples would enable us to generalise the findings and recommendations from our VFM work. As a result, any financial impacts could cover all cases that fit the particular scenario, not just those cases examined.

Key steps to bear in mind are:

- **Ensure your approach is rigorous.** Follow the good practices specified in Part 4 of this guide.
- **Keep the department informed.** Seek agreement to the cases selected and how you intend to generalise the results before starting the work.
- **Demonstrate how the recommendation applies to other cases.** Be prepared to have to demonstrate your findings. Maintain detailed records of your findings and methodology in order to persuade a department that your results can be generalised.
- **Be prepared to negotiate the results with the audited body.** The department might want to re-perform your analysis themselves before they accept your findings. Conversely, the report might have to refer to an 'estimated' rather than an exact figure. For example, our report on Prison Catering [HC 277 1997-98] identified that stock holdings at the prisons examined could be reduced. If all prisons reduced their holdings of food stocks from 27 to 21 days, this would yield a one-off saving of some £350,000.

"It is final," said Holmes. Something in his tone caught my ear, and I turned to look at him. An extraordinary change had come over his face. It was writhing with inward merriment.

The Adventure of the Norwood Builder



Further reading

- Case study research . . . Robert K. Yin
- The discovery of grounded theory: Strategies for qualitative research . . . Glaser and Strauss
- The comparable cases strategy in comparative research. Comparative Political Studies Vol. 8 – Lijphart
- Case study evaluations . . . GAO
- The Penguin Complete Sherlock Holmes . . . Sir Arthur Conan Doyle

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