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# RESEARCH METHODS in ACCOUNTING


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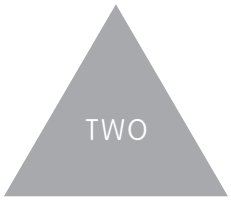
# Developing the Research Idea




## Chapter Contents



We recognise in Chapter 1 that research processes are usually, neither simple, systematic, nor clean, because research rarely proceeds exactly to plan. However, this should not deter us from planning thoroughly in the first place to specify how, in an ideal world, we would like the research to be conducted.

## The research sequence

Figure 2.1 specifies the typical research sequence described by Howard and Sharp (1983) as a series of stages we would expect to progress through in most forms of accounting research, while moving from original idea to eventual publication.

The following chapters of this book address each of these stages, and detail the constraints we might anticipate.

1. **Identify broad area:** Narrow the focus from accounting in general to a stream associated with financial accounting, management accounting, auditing, accounting education or accounting information systems.
2. **Select topic:** Specification of a sub-area to provide a tighter focus, and one for which supervision capacity is available, but one which may be modified in the light of subsequent developments.

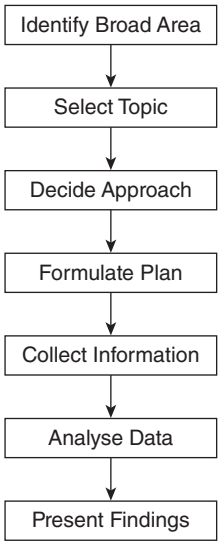



**Figure 2.1** The research sequence

3. **Decide approach:** Early thoughts regarding the approach to be adopted will revolve around the resources available, and in particular access to the necessary data sources. A detailed specification of research methods to be adopted must wait until the literature review has been conducted and theoretical foundations and outline hypotheses have been established.
4. **Formulate plan:** Milestones and targets should be established at the outset so that it is clear how the research will progress over an extended period. This is particularly important for part-time researchers who may be contemplating study over six or seven years. A Gantt chart, or similar, is very helpful in clarifying the extent of the programme of work and the mutual expectations of those involved, especially if this concerns the relationship between candidate and supervisor in doctoral work. This plan should include target conferences where preliminary findings may be presented, especially where deadlines are important to the candidate. The commencement period can often cause anxiety because of the perceived need to make swift progress. It cannot be emphasised enough how important an extended period of reading is to ensure that effort is not wasted performing experiments or surveys which subsequently emerge as being unnecessary or fatally flawed.
5. **Collect information:** Data collection can safely proceed only when we recognise exactly what we want to know, and for what purpose. The planning stage should highlight the period over which we want to collect data; this usually effectively precludes most longitudinal studies, partly because it takes too long to collect data and partly because of the increased vulnerability associated with extended site access. We may require access to commercial databases; if these are an essential requirement then permissions should be sought immediately.
6. **Analyse data:** Methods of data analysis and software requirements should be apparent early in the research process.

7. **Present findings:** Preliminary findings will normally be presented at university workshops and seminars, and then at specialist conferences. These provide the precursor to publication in the refereed literature, which may take place before completion of any associated doctoral dissertation. Publication in the professional literature will bring important findings to the attention of interested practitioners.

The research sequence above can easily be squeezed to provide the elements of the traditional positivist approach as devised by House (1970), and illustrated in Figure 2.2. Again this approach assumes the presence of specific conditions:

- the specification of a priori hypotheses: formulated on the basis of theory and literature before any data is collected or fieldwork contemplated;
- the specification of a priori criteria: to measure the acceptability of the hypotheses, most commonly in the form of standard statistical tests;
- the isolation and control of the variables to be investigated: determination of which variable(s) will be treated as dependent, which will be independent (explanatory), and which will be held constant, matched or ignored;
- the verification of the methods for measuring and the variables: specification of which variables can be measured directly, and how, and those which will require the use of proxy variables, or measurement instruments, of some form.

However, we have to acknowledge that there is no single method which necessarily applies to research in all situations. Thus while the positivist tradition remains the most prominent in the accounting literature, non-positivist approaches have become increasingly acceptable. (Even so, some of the top US journals are still unmoved in their attitude to non-positivist approaches. Baker and Bettner (1997), Lee (2004: 69) and Parker (2012), among others, observe that most of the top journals are devoid of interpretive and critical research studies.) However, management-oriented investigations of change (e.g. the implementation of accounting innovations) may be particularly unsuitable to a scientific approach. Where

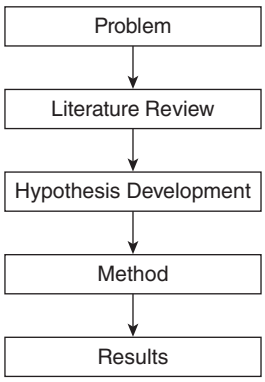



**Figure 2.2** The positivist approach

people are involved and multiple variables are beyond the control of the researchers, including management's own motivation and agenda, scientific approaches are of questionable validity. Checkland (1981: 316) observes: 'attempts to apply scientific methodology to real world, essentially social problems, have been responsible for the limited success of management science'.

Thus we can stay within our original 'research sequence' framework but extend out beyond the positivist approach. Figure 2.3 illustrates the range of possibilities. As we move from top to bottom in the figure, we move from the traditional positivist approaches (archival and experimental studies) through field studies towards a case-based approach typically associated with ethnographic studies. This movement corresponds with an increase in the number of uncontrolled variables, with our increasing inability to formulate testable hypotheses, and with the increasing prominence of the 'human' element.

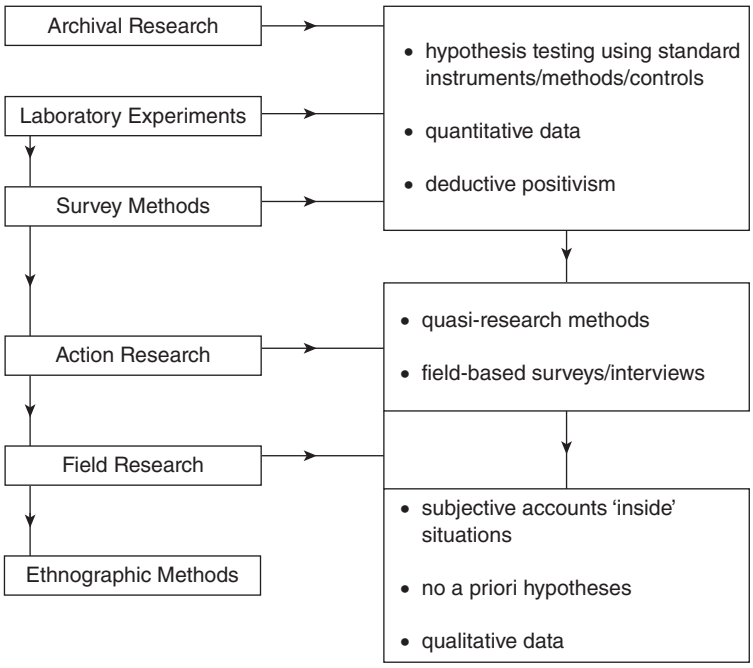



**Figure 2.3** Alternative research methods

## Emergence of the research topic

We should begin by choosing a research topic which is of interest both to the researcher and the supervisor, where the project is contributing to a doctoral qualification. The topic should generate enthusiasm in the researcher at the outset, otherwise he or she is unlikely to last the course of a protracted period of study in which motivation is bound to wane, even temporarily. The source of the topic can be from anywhere, but most commonly:

- a problem at work with potentially wider implications;
- a problem or application spotted in the newspaper or from television;
- a conference presentation revealing the directions being explored by other researchers;
- working papers and completed theses elsewhere – the contents of which are usually at least two years away from publication;
- textbooks – particularly in management-related areas – which are a constant source of untested theories;
- review articles, analysis of the literature in a particular area, to reveal the current boundaries of knowledge and a potential research agenda. The *Journal of Accounting Literature* is a particularly useful source in this regard (e.g. Jones and Shoemaker, 1994; Bauman, 1996; Dunk and Nouri, 1998; Gramling and Stone, 2001; Searcy and Mentzer, 2003; Cole and Jones, 2005; Henri, 2007). Also good is *Accounting Organizations and Society* (e.g. Libby and Luft, 1993; Langfield-Smith, 1997; Hartmann and Moers, 1999; Ahrens and Chapman, 2006; Gerdin and Greve, 2008). The under-rated *Journal of Accounting, Accountability and Performance* (e.g. McGowan et al., 2000; Liou and Smith, 2007; Smith and Chang, 2009) also provides a useful source.
- Review monographs (e.g. Ashton and Ashton, 1995, information processing; Brownell, 1995, management accounting; Trotman, 1996, auditing; Smith and Gurd, 2000, behavioural issues) are also helpful, as is Foster's (1986) excellent book, which unfortunately has never been updated since this second edition.
- Refereed journal articles, particularly the final sections, revealing flaws in existing research, gaps in our knowledge and research opportunities. This may, directly or indirectly, establish a future research agenda in the topic area, which the current authors may not be pursuing.

The ideas will rarely emerge, therefore, from a 'spark' of original thought. More likely, the thought development will have emerged elsewhere, with the originator having either discarded his or her ideas or not seen their full value. It may fit an 'added value' concept in the same way as a successful innovation may be remote from the inventor. This may be in the form of relating two concepts from different disciplines, in a manner which provides an application opportunity in the accounting environment. Here the 'success' is the publishing of research findings in a respectable journal. To do so we will inevitably be building on the work of others.

The common element in each of the above approaches is 'reading' – hence the common advice given to doctoral candidates of 'reading, reading and yet more reading' to know an area and spot the opportunities. Candidates usually have a much greater commitment to a topic if they have developed it themselves, yet many find idea-generation an extremely difficult process. Thus it is not uncommon for the supervisor to be the source of the research idea, because active and experienced researchers usually have far more ideas than they are capable of exploring by themselves. As Gill and Johnson (1997, 2002, 2010) observe, topic selection can be risky if left entirely in the hands of the candidate; the chosen topic may prove to be too small, too large, or simply not feasible in the time frame (especially for longitudinal studies). There may need to be a trade-off between the ownership/commitment associated with a student-selected topic and the practicability/timeliness expected of a supervisor-directed preference. Commonly, candidates will contemplate studies which

involve the implementation of an accounting change, in order to monitor the change process and the resulting impact on financial outcomes. Such a model is rarely feasible because, apart from the access problems, involvement and data collection will be necessary over a period usually extending beyond that permitted within a standard candidature.

Once the germ of an idea is forthcoming it must be worked over to see if it really constitutes 'research'. For example, are we sure that it is more than a consultancy project? Is it more than a trivial problem with no wider implications? Is it more than a replication of something someone else has done before, or done in a different industry or different country? If we are happy in this regard then several other questions emerge:

- Is the project 'doable' in a reasonable time frame (e.g. the period of candidature)?
- Will the project fit the NIRD acronym (usually attributed to Rashad Abdel-Khalik during his tenure as editor of *The Accounting Review*) in that it is new, interesting, replicable and defendable? Unsurprisingly, the acronym fits a positivist outlook since replicability may be impossible to guarantee in field study settings.
- Will the data required be readily available? If site visits are required, will access be available over a sufficient time period and to a sufficient depth? This last scenario is of great practical concern and difficult to control. Young and Selto (1993) and Lapsley (2004: 184) each report on studies whose depth was seriously curtailed because management changed its mind and restricted the access to personnel due to be interviewed. Worse than that, there are numerous cases of change of company ownership during the data collection period, resulting in further site access being permanently denied.

Once the general topic area has been determined, it may be refined by formal methods (e.g. brainstorming, attribute listing, etc.) to identify possible fruitful directions and potentially interesting relationships, and to eliminate blind alleys. Diagrammatic aids, particularly whiteboards, are very helpful at this stage for mapping ideas, variables, relationships and processes.

## The research proposal

Attention to the fundamental requirements of the refereed literature will allow the researcher to produce an outline research proposal, one that is continually revised during the reading period and may nevertheless have to be revised further during the conduct of the research itself due to unforeseen circumstances. A typical research proposal will include the following elements:

- **Title** – should make it clear what you are trying to do.
- **Abstract** – should summarise the problem, objectives and expected outcomes.
- **Issues** – why they are interesting and important.
- **Objectives** – how the study relates to the problem.
- **Literature** – review of relevant, themed publications.
- **Method** – the how and why of the process.
- **Benefits** – the anticipated outcomes that make this study worthwhile.

A working **title** is important to clarify the topic, especially if external grant income is being sought to support the project. However, the final title is rarely the original one and there are plenty of opportunities to make changes.

The **abstract** is an important departure at this stage, because it allows the researcher to speculate on what the outcomes of the research might be should everything go according to plan. The abstract can be ambitious initially, but will require revision (perhaps radical revision) as problems and constraints emerge in the research process.

The contribution of the paper and the way that it aims to address important **issues** in a systematic manner are fundamental to its success. Internal consistency and overall coherence should ensure that the **objectives** and the intended approach are appropriate.

The outline **literature** review may be incomplete but it must nonetheless identify the key motivating literatures and theories. Research candidates must recognise that the literature review is a constantly moveable feast and something that will be added to right up to final presentation of the research findings. One of the major deficiencies of both papers and dissertations is that they frequently overlook the most recent relevant publications: it can be a heart-stopping moment when one is about to submit the thesis, and the latest issue of a journal appears to report the outcomes of a research project very similar to one's own! At the very least this new paper must be cited. A common complaint from inexperienced researchers is that there is 'no literature' available. If this is true, it may mean that the projected topic may be too trivial to consider. More likely, however, is that the literature review should drill down further and search on different keywords. That there is a dearth of recent literature on a topic may foreshadow problems. For example, papers on 'decision-making heuristics' were common in the late 1970s and early 1980s, and papers on 'group decision-making' common in the mid-1980s, but progress in both of these research areas has slowed, and publications are relatively rare because the psychological theories underlying the research have not developed sufficiently to facilitate new approaches. In a similar manner, we have witnessed the demise of normative accounting research since the early 1970s, it being increasingly supplanted by research based on positive accounting theory. With respect to apparently new projects, for example, research into 'e-commerce' related topics, students must recognise that e-commerce is just a new way of doing business, and that their review must address the implementation of prior business innovations.

Discussion of **method** and **theory** should address the alternatives available in order to demonstrate that the preferred choice is the most appropriate. The proposal should also echo the **benefits** of the research, in particular its contribution to knowledge and the potential implications for business practice.

The research proposal would normally form a central feature of any application for ethics approval, and must therefore demonstrate the value of the research, the integrity of the methods employed and the extent of the involvement of human participants. Students are often unsure as to the length and detail required in a research proposal, and there may be restrictions imposed by the academic institution as to length. But focus is the essential element – it should be clear what the objective of the research is, and what theories and literatures are driving it.

Where longer proposals are permitted students may also see the proposal as providing a much-abridged first-draft of chapters 1, 2 and 3 of a subsequent thesis!

## Conceptual frameworks

A valuable part of the initial planning process is the development of a conceptual representation of the research project. This can help to clarify the important relationships (and the need for supporting theory), the explanatory and intervening variables, as well as the demonstration of causation.

The inductive and deductive approaches identified in Chapter 1 provide an objective alternative to the conduct of research, but neither allows the opportunity for human interaction: the inductive approach, where new theory is developed on the basis of fresh observations (as is most commonly the case in hard sciences, like astronomy), and the deductive approach, where theory provides the basis for the testing of empirical observations (and which is the most common form of positivist accounting research). The deductive approach is suitable in a highly structured environment, involving the empirical testing of theoretical models, so that its reliability is dependent on the integrity of quantitative and statistical methods. However, the causal relationships explored rely on an internal logic and take no account of the human relationships present. The application of the inductive approach in the accounting environment necessitates a variation to the traditional model such as that provided by Kolb's Experiential Learning Cycle (Kolb et al., 1979: 38), which is illustrated in Figure 2.4. Recognition of the importance of internal processes and human relationships to the inductive approach allows for the existence of human subjectivity without distorting research findings, even though they may be qualitative and not replicable. Where human relationships are central to an understanding of accounting behaviour the approach exploits the subjective environment.

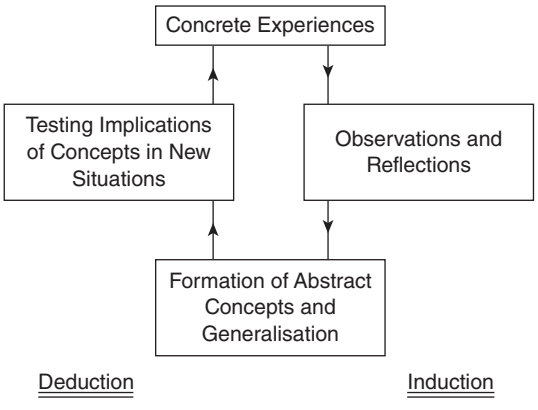



**Figure 2.4** Kolb's learning cycle

Although both models provide opportunities in accounting research, the deductive approach offers greater possibilities for the implementation of scientific methods, since it facilitates arguably more reliable measurement and control. Grounded theory (discussed in more detail in Chapters 3 and 10) illustrates the potential for inductive methods in accounting research.

We can therefore develop the model of the deductive process (see Figure 2.5) so that it corresponds with Popper's (1959) defining characteristics of scientific theory:

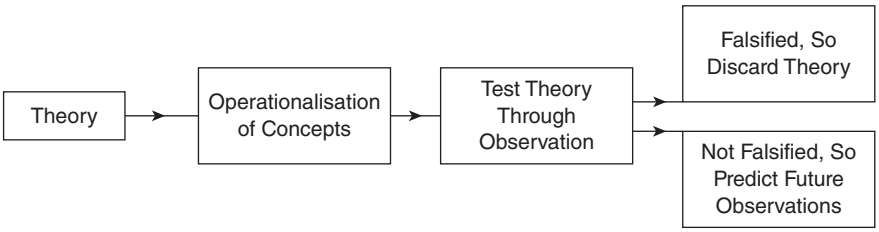



**Figure 2.5** The deductive process

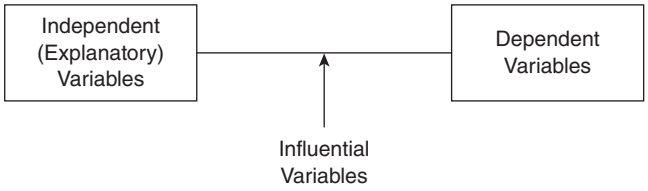



**Figure 2.6** The conceptual schema

- the theory is capable of empirical testing;
- scientists (and researchers) should make rigorous attempts at falsifying theory;
- science advances as falsified propositions are left behind, leaving a core of theory still to be disproved.

The basic conceptual schema (see Figure 2.6) provides a powerful tool for the examination of causal relationships in a positivist environment. By establishing the key variables of interest, and the other potentially influential factors, we can form a better impression of the breadth of the problem.

The design problems associated with the identification and measurement of variables may mean that the basic schema needs to be modified according to Figure 2.7.

What is also apparent is that the simple conceptual schema of Figure 2.6 must be regarded very much as a preliminary picture which will quickly outlive its usefulness. While helpful to begin with it must now be modified, and further detail added, to allow

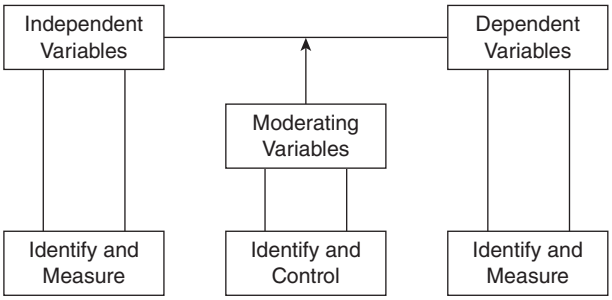



**Figure 2.7** Measurement issues

the further development of hypotheses and data-collection methods. Chapter 3 focuses on these issues in the development of the important links between theory, literature, hypotheses and methods.

In Chapter 1 we acknowledged our debt to researchers in the natural and social sciences. It is now helpful to turn to popular literature, which provides highly readable explanations of complex situations, for an insight into the emergence of research ideas, the development of research questions and the airing of potential solutions for testing, to illustrate the research sequence in practice. It is instructive to consider the different scope of original research in solving practical problems by examining the particular aspects of three well-documented stories from non-accounting environments. Thus we explore the development of new theory in a chemical environment in 'The structure of DNA', the development and testing of alternative strategies to address a sporting issue in 'The Bradman problem', and the solution of apparently insuperable implementation issues to a problem where the 'answer' was well known in 'The longitude problem'.

## The structure of DNA: the development of new theory

James D. Watson's (1968) *The Double Helix* (subsequently filmed as *Life Story*) provides a brilliant description of the exciting process of discovery in scientific research, even if the approach adopted is rather unorthodox. The development of theory and conceptual modelling, from systematic deductions based on the empirical findings of others, is conducted in a competitive environment where the ultimate prize for winning the 'race' is the Nobel Prize. (Watson, together with Francis Crick, both of Cambridge University, and Maurice Wilkins, of King's College, London, were awarded the 1962 Nobel Prize for Physiology of Medicine for their pioneering work during 1951–52.)

Sir Lawrence Bragg reflects on these achievements by researchers in his Cavendish Laboratory through a revealing preface to Watson's book, with implications for research ethics:

> He knows that a colleague has been working for years on a problem and has accumulated a mass of hard-won evidence, which has not yet been published because it is anticipated that success is just

> around the corner. He has seen this evidence and has good reason to believe that a method of attack which he can envisage, perhaps merely a new point of view, will lead straight to the solution. An offer of collaboration at this stage might well be regarded as trespass. Should he go ahead on his own? (Bragg, in Watson, 1968: vii)

That Watson and Crick, at the Cavendish, did proceed with a belated relationship – though collaboration is too strong a word – with Wilkins and Rosalind Franklin is a matter of history. The course of their investigations, and the factors leading to their success in developing a new theoretical model, have implications for all research. Essentially, they proceed to develop a model which fits all of the evidence currently available to them, and await confirmation or disconfirmation of their framework from the empirical findings of others:

- The work of Linus Pauling in the USA on a helix formation for polypeptide chains suggested that DNA (deoxyribose nucleic acid) too had a helical structure. Pauling's early attempts at modelling though, without crystallographic evidence, had produced stereochemically impossible components. Early evidence from X-ray crystallographic diffraction presented by Wilkins also seemed to suggest a helical structure, but there was no evidence of whether a single, double or triple strand helical configuration was most appropriate. Crick and Watson apparently proceeded on the basis of an educated guess favouring the double helix because most things biological come in twos!
- Ernst Chargaff had produced vital evidence on the ratios of constituent bases, and particularly the equalities existing between adenine (A) = thymine (T), and guanine (G) = cytosine (C). The A–T, G–C flat hydrogen-bonded base pairs formed the core of the Crick and Watson structure, rather like a spiral staircase in which the bases form the steps.
- Important advice from a structural chemist colleague (who just happened to be sharing the same office with Crick and Watson) suggested that the normal textbook formulation of the A–T, G–C bases was incorrect and that they should work with an alternative 'keto' form. Without this important questioning of textbook content, and accepted knowledge, their structure would not have held together. The impact of this finding was that a given chain could contain both purines and pyrimidines (with the capacity to carry the genetic material for self-replication) and that the backbones of the chains should run in opposite directions.

Thus Crick and Watson were able to construct a physical model comprising two intertwining helically coiled chains of nucleotides, right-handed and running in opposite directions, with complementary sequences of hydrogen-bonded bases. The resulting structure was stereochemically possible, and subsequent X-ray evidence from Franklin confirmed that the sugar-phosphate backbone was indeed on the outside of the molecule.

The more general implications for researchers are constant vigilance and a questioning attitude to the work of others and existing publications.

## The Bradman problem: the development of new strategies

Test match cricket in the 1930s was dominated by a single, outstanding individual whose unique gifts of batsmanship threatened to change the way the game was played. Donald Bradman

scored so many runs, and scored them so quickly, that he was likely to win a game almost single-handedly. Ashes test series, once so closely contested, threatened to be one-sided affairs, with Australia the perennial victor. In the 1930 England v. Australia test matches Bradman totalled a record 974 runs at an average of 139.14 per innings, and recorded separate scores of 334, 254 and 232. At the commencement of the 1932/33 series he averaged 112.29 in all test matches, and had already posted six scores in excess of 200 in only 24 completed innings.

Bradman was a phenomenon, some would say a 'freak', and curtailing his dominance became a pressing question for successive England captains. 'The Bradman problem' is capably detailed by Lawrence Le Quesne in his book *The Bodyline Controversy* (1983), and presents an intriguing research question, investigating a number of alternatives that might provide successful solutions.

## 1. Changing the playing conditions

Cricket was played on hard, fast wickets, largely true, though with the occasional unpredictable bounce. If bowlers did not take wickets in the first few overs, when the ball was still shiny and swinging, then they might have a lot of overs to bowl before they got a replacement ball, by which time 200 runs had been scored. Wickets were uncovered and exposed to the elements once a game had started and could become unplayable as a hot sun dried out a wet pitch; these 'sticky' wickets provided a possible solution to the problem because Bradman was nowhere near as prolific on bad wickets as many of his contemporaries were. However, captains could hardly rely on this occurrence to blunt Bradman's genius on a regular basis.

## 2. Changing the rules of the game

Test matches were timeless in the 1930s and played to a finish. Declarations were rare and slow play very common. Further, the leg-before-wicket (LBW) rule made it difficult for the batsman to get out in that way – he had to be caught in front of the stumps by a ball pitching in line, wicket-to-wicket. Life was difficult for bowlers, and a number of other batsmen (notably Ponsford for Australia and Hammond for England) regularly completed double and triple centuries, although none with the regularity, reliability or speed of Bradman.

Reduction of the specified playing time to five (or four) days would mitigate slow play and dull the impact of less talented batsmen content to occupy the crease, but would not affect Bradman – witness his 309 in a day against England at Leeds in 1930. However, timeless tests were outlawed before the end of the inter-war period. Similarly, the LBW law was changed so that batsmen could be given out to a ball breaking back from outside the off stump and striking the pads in front of the wicket.

## 3. Changing the bowling

Bowlers had often sought to restrict the batsman by bowling outside of the leg stump (e.g. Hirst and Foster in the early 1900s), ostensibly to cut out off-side shots but also to restrict

the on-drive through bowling just short of a length. An accurate bowler could therefore depress the scoring rate by keeping the batsman to deflected singles in the arc between the wicketkeeper and square leg. As a consequence the whole game is slowed to a snail's pace – a strategy still used today to curb an aggressive batsman's dominance. But Bradman was too good to fall for such tricks and used his agility, quick reflexes and nimble footwork to move to leg, outside the line of the ball, so giving himself room to hit through the off-side field. Such a strategy would have made less gifted batsmen vulnerable because it entailed the exposure of all three stumps to the bowler, but Bradman could execute the manoeuvre without undue risk.

### 4. Changing the field placings

An orthodox field will involve the placing of fieldsmen on both sides of the wicket, with a majority coincident with the bowler's planned line of attack. This means plenty of gaps in the field and, for inaccurate bowlers, plenty of scoring opportunities. Clearly, a preferred strategy would be to place all the fielders in a tightly confined space and have the bowler deliver a line and length that forces the batsman to play the ball there. This is a sound strategy for an accurate bowler – witness Laker's devastating use of a packed leg-trap to a turning ball in 1956 – but for a batsman of Bradman's ingenuity we now have a vacant off-side to be penetrated by inventive, unorthodox shots.

### 5. Introducing a 'bodyline' attack

While a combination of numbers (3) and (4) above provides a partial solution in restricting scoring opportunities, only impatience will induce eventual dismissal. For Bradman it may do neither. However, together they provide the basis for a potentially successful solution: 'leg theory' will dictate the line of delivery, but we need also to control the height of the delivery to induce the batsman to give chances from playing the ball in the air. Herein lies the Jardine–Larwood proposition, initiated by Douglas Jardine, England's captain in 1932 and executed brilliantly by Harold Larwood, the fastest and most accurate bowler of his time.

Extreme fast bowling does not provide even Bradman with the time to move outside the line consistently without risk. The introduction of a high proportion of short-pitched balls rearing towards the throat or the ribcage of the batsman makes scoring without risk extremely difficult. Batsmen are likely to fend off the ball defensively – to be caught in the leg-trap ring of close catchers. If they try to attack by hooking the ball over the in-field, they fall prey to a number of deep-set fielders on the leg-side and behind the wicket. Concentrating almost all the fielders in the arc between wicketkeeper and mid-wicket, five close to the bat and three close to the boundary, covers almost all the options. Scoring is restricted to risky options and bad balls.

This form of attack was 'successful' in that it resulted in a 4–1 series victory for England and also provided an appropriate solution to 'the Bradman problem' in that he scored only one century in the series, a total of only 396 runs at an average of just 56.57. He still tried

to play in a cavalier fashion, moving outside the line to play tennis-like shots; the result was brilliant, hectic cameos that were over all too soon for his team's requirements.

However, the risks of bodily injury to the batsman from the bodyline solution were high, and its introduction was seen to be ungentlemanly and against the spirit of the game. Jardine and Larwood were never chosen to play against Australia again. The subsequent 1934 test series was very much a fence-building exercise, with the England bowling friendly and 'bouncer' free. Bradman was again unconstrained and scored 758 runs at an average of 94.75. The success of the leg-theory solution generated further changes to the rules of the game, with a restriction on the number of fielders permitted on the leg-side behind the wicket and the number of short-pitched balls that were allowed to be bowled per over.

The more general implications for research are that there may be legal, moral, ethical or professional circumstances which prevent either the conduct of the research or the implementation of recommendations from the research findings.

## The longitude problem: implementing solutions

The measurement of longitude at sea requires the accurate measurement of both the time at the current location and that at the Greenwich meridian, or some other similar base point. The time difference allows the calculation of geographical separation – since the 24-hour revolution of the Earth constitutes a 360 degree spin – so that a one-hour time difference constitutes 15 degrees of longitude, where one degree of longitude is equivalent to 68 miles on the Equator. The measurement of local time is not a problem, especially during hours of daylight, but in the absence of accurate timepieces knowledge of the corresponding time at the base point remains a considerable problem.

The consequences of being unable to measure longitude were serious and have been detailed by Dava Sobel in her book *Longitude* (1995). Shipwrecks and lost vessels were common, and piracy was facilitated by the need for ships to track across common lines of latitude on the 'trade routes' to maintain their position. The pendulum clocks of the 1660s, due to Huygens, had been used to demonstrate the possibility of measuring longitude at sea with timepieces, but they were only helpful in favourable weather. So much so that Sir Isaac Newton (cited in Sobel, 1995: 52) was forced to admit in 1714: 'One [method] is by a watch to keep the time exactly. But by reason of the motion of the ship, the variation of heat and cold, wet and dry, and the difference of gravity in different latitudes, such a watch hath not been made.' Newton clearly had astronomical, or at least scientific, solutions in mind rather than mechanical ones, necessitating the consideration of alternative solutions.

### 1. Existing methods

These were largely confined to 'dead reckoning' and 'compass method' approaches. Dead reckoning required estimates to be made of the speed of the ship, in conjunction with calculation of the effects of wind speed and currents. Its success relied on good seamanship,

reliable maps and luck! Compass methods were concerned with comparisons between magnetic north and 'true' north as shown by the pole star. Relative positions allowed the estimation of longitude without the necessity of measuring time. However, compass needles were notoriously unreliable, with a great deal of variation for the same compass on successive voyages. This, coupled with variations in terrestrial magnetism, made readings highly dependent on the particular seas being traversed.

## 2. Eclipse data

Eclipse data were thought to be potentially useful. Sonar and lunar eclipses provided opportunities if it was known when they were expected to be observed in other locations, but such occurrences were far too rare to provide a realistic navigational aid. Galileo had established that eclipses of the moons of Jupiter were extremely common and predictable, making them an accurate means of specifying longitude at specific land-based locations. However, movement aboard ship made this an impossible strategy for navigation, even when the night skies were clear.

## 3. Lunar distances methods

These involved measuring the distance between the moon and the sun, by day, and between the moon and stars at night. Such methods required detailed data on the track of the moon and the positions of individual stars so that the disappearance of particular stars behind the moon could be predicted. The complexities of the moon's orbit impeded progress in the prediction of the required measurements at different locations, and it was not until 1725 that Flamsteed's posthumous almanac of star positions was published. Even so, the available tables still meant it took four hours to calculate longitude (subsequently reduced to 30 minutes by Maskelyne's 1766 almanac).

The lunar distance method was therefore shown to be a theoretically possible means of accurately computing longitude, made more practicable by the invention of the quadrant (later sextant) in 1731 to measure elevations of, and distance between, moon and sun by day, and moon and stars by night. This permitted an estimate of time differences between a ship and known, fixed land locations. Even so, actual measurement proved impossible at times for a variety of reasons:

- weather conditions occasioning fog or thick cloud cover;
- the moon is so close to the sun for about six days per month that it disappears from view; and
- the moon is on the opposite side of the Earth from the sun for about 13 days per month.

John Harrison adopted a more direct solution to the problem, questioning the position of Newton and proceeding to build a succession of clocks that were shown to be accurate to fractions of a second per day. By eliminating problems of friction, he developed clocks that required no lubrication or cleaning. This, combined with the use of bi-metal strips of non-corrosive

materials, overcame the problems of temperature change and rust. The choice of innovative balancing mechanisms also meant that the clocks were virtually unaffected by the most severe weather conditions.

By the time Harrison died in 1776 copies of his watch were still rare and expensive (in excess of £200) whereas a good sextant and set of lunar tables could be purchased for as little as £20. This considerable price difference meant that the 'lunar distance method' of calculation remained prominent until more affordable watches became available in the early 1800s through the sale of the mass-produced Arnold/Earnshaw pocket 'chronometers'.

Both timeliness and resource cost remain fundamental elements in the conduct of research projects and the implementation of their findings.

The scope of these three examples is very different, concerned respectively with the development of new theory, the development of workable solutions and the implementation of workable solutions. As we suspected, the research process is neither simple, systematic nor clean in any of the cases. What is common throughout are the pivotal roles played by 'theory' and 'validity': good theory produces good findings, and we are able to evaluate both the reliability and the validity of these findings through external reference. The following chapter examines theory in more detail, and expands the consideration of reliability and validity as desirable characteristics of accounting research.

## Strategic management accounting

Within an accounting environment we can observe the identification, definition and solution to practical business problems, solutions which require the careful specification of the research question, the development of hypotheses and alternative implementation strategies. Thus John Harvey-Jones (1992; Harvey-Jones and Massey, 1990), the celebrated 'troubleshooter' of the eponymous television series, and who predates the recent 'reality' television explosion, details his approach to the investigation of practical issues in real business situations. His activities might be considered to correspond to a form of action research in that he is actively collaborating onsite with other individuals, although his practices rarely correspond with accepted 'good practice' in action research. Harvey-Jones appears to develop a systematic model during the first series for application in the second series (*Troubleshooter* 2). Central to this model is the specification of a fundamental research question based on an analysis of the published financial accounts and empirical observation of the site. Interestingly, this specification of the research question rarely coincides with that of the CEO of the organisation concerned. Further observation and benchmarking against the performance of other organisations allows the development of hypotheses and alternative approaches that may yield the desired outcome. Reporting of the recommendations often causes conflict with the senior management of participating organisations, especially in the earlier episodes, where the importance of organisation culture to an acceptable solution appears to have been underestimated or overlooked. The stages of analysis depicted in Figure 2.8 generate the more generalised framework for business solution and improvement opportunities in Figure 2.9.

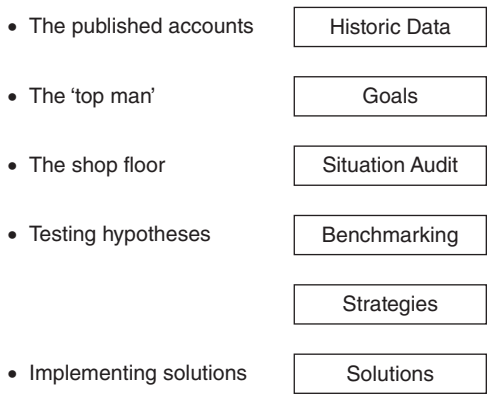



**Figure 2.8** The Harvey-Jones approach to problem-solving

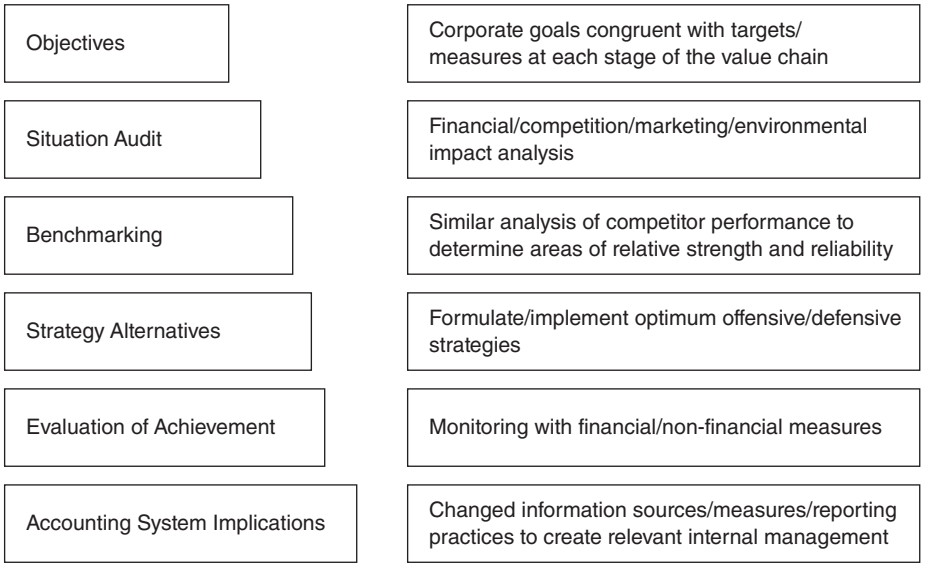



**Figure 2.9** Generalised process–improvement sequence

This approach has provided the basis for a number of similar, more recent, consulting oriented 'factual entertainment' ventures: thus Gerry Robinson examines the frailties of family business relationships in *I'll Show Them Who's Boss* (2000) and in Robinson (2004). Here he highlights the importance of management strength in each of six areas: leadership, strategy formulation, staff relations, implementing redundancies, focus on the key issues and communication. Other business analysis and solution cases are explored by the BBC in, for example, *Trouble at the Top* (2004), *The Ferocious Mr Fix It* (2006) and *Alex Polizzi: The Fixer* (2012).

It is apparent in all these ventures that we have here a systematic, almost strategic, approach that owes relatively little to theory. An accepted positivist research sequence offers great similarities, except that a much wider preparatory stage is undertaken, which is rarely restricted to the consideration of a single case. Specification of the individual elements of the research sequence here provides the basis for their detailed discussion in Chapter 3, with the focus on theory and literature sufficient to be able to build testable hypotheses.

## Further Reading

Ahrens, T. and Chapman, C. (2006) 'Doing qualitative field research in management accounting: Positioning data to contribute to theory', *Accounting, Organizations and Society*, 31 (8): 819–41.

Foster, G, (1986) *Financial Statement Analysis*, 2nd edn, Prentice-Hall, Englewood Cliffs, NJ.

Gill, J. and Johnson, P. (2010) *Research Methods for Managers*, 4th edn, Sage, London.

Lapsley, I. (2004) 'Making sense of interactions in an investigation of organizational practices and processes', in C. Humphrey and B. Lee (eds), *The Real Life Guide to Accounting Research,* Elsevier, London: 175–90.

Lee, T.A. (2004) 'Accounting and auditing research in the United States', in C. Humphrey and B. Lee (eds), *The Real Life Guide to Accounting Research*, Elsevier, London: 57–62

Parker, L.D. (2012) 'Qualitative management accounting research: Assessing deliverables and relevance', *Critical Perspectives on Accounting,* 23: 54–70.

Ryan, R., Scapens, R.W. and Theobald, M. (2002) *Research Method and Methodology in Finance and Accounting*, 2nd edn, Thomson, London.

Trotman, K.T. (1996) *Research Methods for Judgment and Decision-Making Studies in Auditing*, Coopers & Lybrand, Melbourne.

Watson, J.D. (1968) *The Double Helix*, Penguin Books, New York.