

1 Scope and Nature of this Handbook

1.1 Objectives and Target Audiences

Marc checks his PowerPoint presentation one last time. He is a bit nervous, and experiences some stage fright. At the same time, he is also quite excited. This afternoon he will get a full hour at the weekly marketing management meeting to present and defend his design for a new medium-term sales planning system.

It was several months ago that Marc, a graduate MBA student, started his internship at the marketing department of a small business unit in industrial measurement equipment, part of a multinational company. At the intake the assignment had looked quite straightforward, but during the orientation stage in the first weeks it proved to be quite a complex one. This was partly due to political tension between corporate headquarters and the struggling business unit and partly to the fact that market research by the marketing department proved to be underdeveloped. After the orientation phase, therefore, the assignment was broadened somewhat. It was not always easy; some people supported his assignment, giving him much time and many ideas, but others were somewhat sceptical, and were reluctant to interrupt their busy schedules to talk with him (especially at headquarters). However, with the strong support of the marketing manager, his principal for the assignment, his company mentor and his academic supervisor, and, furthermore, with the methodological support of the book *Problem Solving in Organizations*, he had been able to overcome these obstacles. He had carried out a systematic review of the literature on the various aspects of his assignment and had used this as a major input for improvement proposals for market research and for the design of his sales planning system; his design surely is an example of the 'state of the art'.

Now he is confident that the meeting will be successful and that his design of a solution will be formally adopted. The key participants of the meeting have been briefed by him beforehand on his design, and most seem to support it, including the marketing manager. The only people whose positions he is not sure of are the two market researchers, who keep asking awkward questions. Never mind, though; the die has been cast. He has done everything he can to produce a really sound design; he is ready for the final test of his internship!

This handbook gives you a design-oriented and theory-informed methodology for business or organizational problem-solving projects, whether driven by individual students such as Marc or a group of students, or a (junior) professional working in or for an organization. Our methodology has been developed for university business or management course programmes such as MBA courses, which consider the development of student competences in solving real-life business or organization problems as a key objective of their programme. In other words, our methodology is for business or management courses aiming to educate professionals. The core competence of many scientists (however, not for all of them) is being able to do sound explanatory research, researching and explaining ‘that which is’ – the actual. However, for professionals such as doctors, lawyers and engineers, and aspiring professionals such as you, it is field problem solving (FPS). Professionals are interested in changing ‘the actual’ into ‘the preferred’. The core competence of a professional is being able to do effective theory-informed field problem solving or, using other terms, effective evidence-based practice (EBP).

By ‘field problem’ we mean a situation in reality that can or should be improved in the view of influential stakeholders, such as an ill person, a polluted water well or an unreliable logistics system. This handbook provides the methodology for dealing with field problems in business and management (as opposed to dealing with pure knowledge problems, such as the question of why rain and sun produce a rainbow or why certain sales promotion activities are more effective than others).

For business or management students, the development of the competence of dealing with field problems can be supported by in-house courses on problem-solving methodologies, based on written case studies. However, a very important complement to this in-house training is problem solving in a real-life context. This can be achieved in various ways, ranging from a trainee within an organization taking on a problem-solving project of 4–8 months or so, to a

smaller project undertaken by a group of students visiting an organization on a few occasions to do their analyses and present their proposals.

The target audiences of this book include undergraduate and graduate students of business or management course programmes, in addition to young professionals from other disciplines who want to develop their competences in problem solving in organizations, as well as students in areas other than business and management who expect to work in organizational contexts. For most, the main learning objective will be the design and execution of FPS projects in a professional manner. However, for graduate students, the learning objectives can – and maybe should – also include the competence of adding to the knowledge base in their field. The first objective of an FPS project is to improve the performance of the business system under consideration; the first use of the knowledge developed in the project is to solve a specific case. However, such a project can also produce knowledge that can be transferred to other settings, especially if there are comparable case studies available, allowing for generalization across cases. This book also deals with the possibilities of developing generic knowledge as well.

This handbook can be used in a general classroom course to prepare for business or organizational problem-solving fieldwork, and subsequently as a sourcebook for preparing and running actual field projects. It can also be used as additional reading (possibly with one or more classroom training sessions) for a disciplinary course aiming to combine theory with the application of that theory in practice.

The methodology of this handbook has been developed on the basis of more than 15 years' experience in supervising business or organizational problem-solving projects by students of the techno-MBA programme at Eindhoven University of Technology. These projects included short group assignments in FPS, but most were 6–9-month graduation projects aimed at further developing students' competences in theory-informed field problem solving. The business or organization problems to be solved typically had a significant technical and socio-economic content. However, this handbook deals with the conceptual and technical set-up of the project itself, not with methods related to the content of the problem. Unlike many books on consulting (see, for example, Kubr, 1996; McKenna, 2006), this book does not have sections on problem solving in different disciplinary contexts. Typically, in the context of a university course, university supervisors will provide students with the necessary disciplinary support. Chapter 3 provides further discussion on the nature and application of our methodology for FPS.

1.2 Design-Oriented and Theory-Informed Problem Solving in Organizations

As is discussed in more detail in Chapter 3, a real-life FPS project typically consists of an analysis and design component, an organizational change component and a learning component, during which the organization aims to realize improved performance on the basis of the designed solution. The methodology presented in this handbook focuses on

- problem and context analyses;
- the design of the solution for the business problem;
- the design of the change process needed to realize that solution in new or adapted roles and procedures;
- the development of organizational support for solution and change plan; and
- the evaluation of outcomes and reflection on the problem-solving process.

It is a methodology for business or organization improvement on the basis of sound designed solutions (as opposed to an emergent or a ‘muddling through’ approach). This is why we use the term ‘design-oriented’. We only briefly discuss the actual management of the change and learning parts themselves, taking place after the decision-making on the solution and its implementation. This is in line with the usual scope of a student FPS project (and many other consultancy projects), in which the student is not participating in the – often quite protracted – change and learning parts.

‘Theory-informed’ means that, in this approach, problem solving is not carried out in a craftsman-like way, largely relying on one’s own experience and informed common sense. Rather, it is informed by theory, using state-of-the-art literature. The literature to be used in FPS entails two complementary aspects:

- (1) *Object and realization knowledge*: knowledge of the *object* of problem solving – that is, knowledge of organizations and management in general, and of various business systems and functions such as marketing, operations, innovation and finance in particular; and knowledge of the *realization* of business or organizational solutions through planned change.
- (2) *Process knowledge* (or the methodology of FPS): knowledge of approaches and methods to be used in the analysis and design of business solutions and change plans, from problem definition to decision-making on proposed solutions and change plans.

This handbook focuses on the second category, that of process knowledge for business problem solving. It also discusses some elements of realization knowledge in the context of change plan design, but it does not discuss object knowledge, as this will be provided by the disciplinary courses of the business programme, supported by the academic supervisors of the problem-solving project.

‘Theory-informed’ does not, of course, mean copying theory into particular cases. Theory is by definition generic and must always be contextualized for use in actual problem solving. ‘Theory-informed’ in FPS within an academic programme specifically means the *comprehensive*, *critical* and *creative* use of theory:

- (1) *comprehensive*, because problem solving should be based on a systematic review of the existing literature on the issues in question;
- (2) *critical*, because you should judge the value and limitations of existing literature, among other things, on the basis of the evidence given (for instance, the design of business solutions may be informed by ‘management literature’, typically providing little evidence on effectiveness, as long as you are aware of its limitations); and
- (3) *creative*, because you should not just use theory but aim to build on it, play with it and add to it in order to produce appealing designs.

Theory-informed does not mean that you have to find a *specific* theoretical perspective on the problem in question, like the theoretical framework often requested to be used in explanatory research. In such research a specific and therefore one-sided perspective can be useful as this may uncover certain, otherwise possibly overlooked, elements in the situation, at the same time neglecting other elements not to be found in this perspective. However, in FPS you work more holistically, aiming to use all or the most important perspectives to understand the problem and to design an effective solution.

Theory-informed design can be regarded as design on an academic level, in which theory is very important, but at the same time with an awareness of its limitations. We therefore follow Tranfield *et al.* (2003) in using the term ‘theory-informed’ rather than ‘theory-based’. Nevertheless, this book can be regarded as a handbook on the methodology of EBP in business and management. As said in the Preface, this handbook may in fact be used for a foundation course in EBP.

Evidence-based practice is a generalization of evidence-based medicine (see, for example, Trinder and Reynolds, 2000) to other professional disciplines (see, for example, Hamer and Collinson, 2005; Young *et al.*, 2002). It can be defined as

FPS, using the best available evidence.¹ This is the comprehensive, critical and creative use of theory in FPS, as opposed to more craftsmanship-like approaches, based on personal experience and informed common sense; and this is precisely what this handbook proposes to do in the field of business and management.

Opponents of EBP fear that the term ‘evidence-based’ implies that a professional should use only interventions for which there is sufficient ‘evidence’, and that the ‘best practices’ resulting from the available evidence should be followed to the letter. This is not only impossible – existing theory is always limited and should, furthermore, always be contextualized to the case at hand – but also undesirable, because it constrains professional judgement and inhibits creativity and innovation. For us, EBP only means the *comprehensive, critical and creative* use of theory in FPS; no more, no less.

1.3 How to Use this Handbook

This handbook provides you with the theory on how to set up and drive an FPS project. It should be used in a comprehensive, critical and creative way. By ‘comprehensive’, we mean that you should not use the theory as a Chinese menu from which only to pick and choose certain elements. Rather, the approach as a whole should be followed. At the same time, the theory should be used critically and where necessary should be adapted to the nature of your business problem and assignment at hand. Chapter 3 supports the critical aspect by discussing the limitations of this theory and the types of problems for which it can be used.

The creative use aspect means that you cannot simply copy the approach given in this handbook: you have to contextualize it. The approach provided should be regarded as a ‘design model’: a general model to be used as the basis for the design of the specific set-up of an FPS project for a particular setting. What we give you is a kind of ‘norm process’: a well-tested example of how to do something, described in terms of a ‘generic context’. In reality, contexts are not generic, so you always have to make your own specific project design. At the same time, you should be able to justify any deviation from the normal process

¹ In business and management, EBP (or evidence-based management) tends to be defined as ‘*decision-making, using the best available evidence*’ (see e.g. Briner *et al.*, 2009). This definition follows the conventional one in medicine, but seems to focus on evidence to be used in choosing between known alternatives. We prefer the broader ‘*problem solving using the best available evidence*’ – evidence playing a role in the whole process from problem definition, analyses, solution design and change process design.

on the grounds of the requirements of the specific context, or on the grounds of the recognized limitations of the normal process itself.

This rejection of a menu-like approach also entails that this book contains no specific formats or forms for, say, meeting minutes, project plans or progress reports. You have to design these yourselves.

In our experience, graduate students are quite able to use a handbook such as this in self-study to prepare and manage their problem-solving projects in the field. However, a good way to learn this approach is to follow a classroom course on the basis of this book. It can be used in courses consisting of a few explanatory lectures, self-study and a number of training sessions, in which paper case studies are used to train for activities such as problem definition, designing a problem-solving approach and preparing a project proposal. However, the best learning experience is to be had in the field: defining problems, capturing data and exploring solutions in the messy, political and sensitive world of real-life organizations, thereby developing the tacit knowledge needed to apply the explicit knowledge of the business course programme. No paper case study can give you that learning experience. Also students with previous business experience, who tend to tackle problems on the basis of their experience and common sense, can benefit from this design-oriented and theory-informed approach to business and organizational problem solving.

2 Types of Student Projects

2.1 Introduction

This handbook deals with fieldwork by business and management students. Such fieldwork can be carried out in the context of a specific course, but can also be done as a graduation project at the end of a course programme to further develop the student's competences and to produce a 'masterpiece' – that is, a project report that proves that the student did indeed master the desired competences.

The approach chosen for a graduation project depends on the research paradigm of the school, the supervisor's preferences for student fieldwork and the student's own preferences. As is discussed in more detail in Chapter 13, there are two main research paradigms to be used in student fieldwork in business or management, namely the *explanatory research paradigm* and the *design science research paradigm* (or problem-solving approach). The explanatory research paradigm is the research paradigm of mainstream research in most social sciences; the design science research paradigm is the research paradigm of professional schools, such as medical schools, engineering schools and, increasingly, business schools.

A student project according to the explanatory paradigm aims to produce descriptive and explanatory knowledge. Such a project will follow the *empirical cycle*. A student project according to the design science paradigm aims to produce solutions to field problems, and will follow the *problem-solving cycle*.

The objective of bachelor-level projects typically is to produce specific, context-specific knowledge. If the empirical cycle is used, this may, for instance, be knowledge about the market potential or the cost structure of a given

product. If the problem-solving cycle is used, the knowledge produced can be a solution (plus its implementation plan) for a given field problem, such as a programme to reduce the selling costs of a given company, or a design for electronic patient files for a general hospital.

The objectives for master graduation projects may include somewhat more ambitious elements. The ambition may not only be to develop context-specific knowledge for a given organization, but also some improvement of or addition to generic theory. If the empirical cycle is used, this could entail descriptive or explanatory theory; if the problem-solving cycle is used, this could involve either additions to explanatory theory or additions to generic design knowledge, to be used to design solutions to field problems.

This handbook presents a design-oriented and *theory-informed* methodology for executing the second type of project. However, in the present chapter both types of project are discussed to show the differences between the two and to position the problem-solving project. At the same time, the examples given in this chapter provide some insight into the type of student projects for which this handbook is written. In the next section we discuss both the empirical cycle and the problem-solving cycle, and in Section 2.3 we examine knowledge-producing processes on the basis of these cycles. Section 2.4 shows the problems if you mix the different cycles, and Section 2.5 gives some concluding remarks.

2.2 Two Basic Process Structures

There are two basic process structures for carrying out fieldwork in business and management – that is, two basic sets of process steps, with the relationships between these steps. These follow, respectively, the *empirical cycle* (de Groot, 1969; Blumberg *et al.*, 2011; Saunders *et al.*, 2015) and the *problem-solving cycle* (Dewey, 1910; Hedrick *et al.*, 1993; van Strien, 1997; van Aken, 2007).

Although the two cycles have a number of research activities in common and although some common quality criteria have to be satisfied, the two cycles are very different. We explain first the empirical cycle, as shown in Figure 2.1.

The observation step is the start of the empirical cycle. In this step you focus on a certain type of business phenomenon in the real world and on what has been written about it in the academic literature. The observation may result in the conclusion that many companies have to deal with this type of phenomenon, though the academic literature has not yet addressed it adequately. During the induction step, possible explanations for the issue are developed, aided by

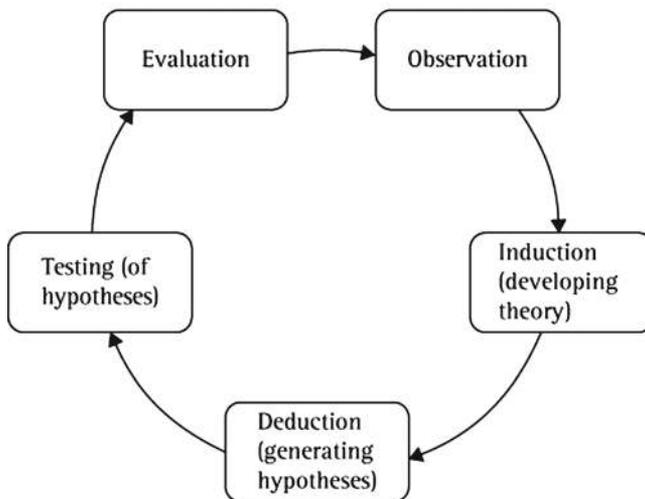


Figure 2.1 The empirical cycle

Sources: based on de Groot (1969); Saunders *et al.* (2015); and Blumberg *et al.* (2011).

related literature – that is, the academic literature that deals with this issue, or, at least, is expected to deal with the issue. The induction step is a theory-developing step.

In the deduction step, the most promising ideas of the induction step are transformed into hypotheses: statements that can be verified by empirical observation and measurement. In the next step, the testing step, these hypotheses are empirically tested. This can be done through the application of statistical techniques on data from surveys or by case studies. Finally, during the evaluation step, the outcomes of the empirical test are examined and interpreted. This may lead to a new research question and a rerun of the empirical cycle.

The empirical cycle can also be used for non-academic reasons, such as to generate specific knowledge for a company. For instance, the empirical cycle can be used to get to know the needs and preferences of a particular group of customers.

Let us now consider the problem-solving cycle, which is shown in Figure 2.2 (see Section 3.7 for a more detailed discussion of the problem-solving cycle).

The problem-solving cycle is driven by a certain business problem. Business problems are not given but chosen by stakeholders. In general, companies face a problem mess of interrelated problems (see Section 4.3 and Ackoff, 1981 on the concept of a ‘*problem mess*’). To formulate a clear business problem, this