

Issues in Front-End Decision Making on Projects

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ABSTRACT ■

The importance of the front-end decision-making phase in projects is being increasingly recognized—the need to “do the right project” is on a par with “doing the project right.” This area is underrepresented in the literature, but there are a number of key themes that run throughout, identifying key issues or difficulties during this stage. This article looks at some of these themes and includes: the need for alignment between organizational strategy and the project concept; dealing with complexity, in particular the systemicity and interrelatedness within project decisions; consideration of the ambiguity implicit in all major projects; taking into account psychological and political biases within estimation of benefits and costs; consideration of the social geography and politics within decision-making groups; and preparation for the turbulence within the project environment, including the maintenance of strategic alignment.

KEYWORDS: front end; strategy; complexity; biases; turbulence

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INTRODUCTION ■

Projects are recognized as an important part of corporate and public life. But ask the archetypical “man in the street” about them, and it is clear that the reputation of projects and project management is that they are generally unsuccessful. A key word often associated with them in the public’s mind is the English colloquialism “white elephant,” which is something whose cost and subsequent upkeep is much greater to the owner than its value (derived from the reputed practice of monarchs giving sacred white elephants as gifts). A newspaper article from 2005, for example, begins, “The Millennium Dome, the great white elephant languishing in east London . . .” (Wray, 2005). Even if the result is seen to be useful, there are often reports in the media of large public construction projects that have suffered huge cost or time overruns, such as Denver’s \$5 billion airport 200% overspend (Szyliowicz & Goetz, 1995), or the United Kingdom’s Scottish Parliament coming in “10 times over budget and more than three years late” (Tempest, 2004). Pinto (2007, p. 7) quotes from an *Infoworld* article describing, “a US Army study of IT projects [that] found that 47% were delivered to the customer but not used; 29% were paid for but not delivered; 19% were abandoned or reworked; 3% were used with minor changes; and only 2% were used as delivered.” Moreover, while all of this may be in the past, our present record seems no better. One of the biggest current projects in the United Kingdom is the “National Programme for IT in the National Health Service,” with a predicted expenditure of over £12 billion during 2004–2014. A recent Parliamentary report concluded, “Four years after the start of the Programme, there is still much uncertainty about the costs of the Programme for the local NHS and the value of the benefits it should achieve. . . . The Department is unlikely to complete the Programme anywhere near its original schedule” (House of Commons, 2007, p. 5).

This is not to say that all projects are managed badly—indeed, the management and governance of many projects have shown considerable improvements in recent years. HM Treasury (2007), for example, gives an upbeat report on the United Kingdom’s Office of Government Commerce. So what explains this strange incongruity? Why have the study and improvements in project management resulted in such a dire reputation for projects? It is the contention of this article that the concentration on project management has been much too narrow. There is more expertise now in delivering efficiently and successfully a well-defined, prespecified project within a clearly defined constant environment. This has proved very valuable in certain circumstances. But a much wider view needs to be taken. The initial choice of project concept is of critical importance. This represents the one key decision of many made during the lifetime of a project, which is likely to have the largest impact on long-term success or failure. By “the project concept,” we mean much more than just the technical solution—it includes the

entire business case, all of the various participating organizations, and the different mechanisms and arrangements involved in the interorganizational relationships (Miller & Hobbs, 2009).

This article emphasizes the front-end phase of the project, when it exists only conceptually, and before it is planned and implemented. This phase includes all activities from the time the idea is conceived, until the final decision to finance the project is made—it is not an unambiguously defined term. The term is similar to the idea of “quality-at-entry,” used by the World Bank (1996) as an indicator to characterize the identification, preparation, and appraisal process that the projects had been subjected to up front. It includes concept identification and selection but not detailed planning stages. At this stage, the consequences of decisions will be highest, while the information available is at its lowest. The cost inflicted by making major changes is also at its lowest. The importance of this stage has been known for a long time, but development here has been very much slower than development of tactics for the execution phase.

The importance of quality at entry has been emphasized in many studies, as noted in Morris (2009); Miller and Lessard (2001); Flyvbjerg, Bruzelius, and Rothengatter (2003); and Meier (2008). The World Bank gave a similar message in a study based on a review of 1,125 of its projects that were evaluated between 1991 and 1994, concluding that projects with adequate or better identification, preparation, and appraisal had an 80% rate, against 25% for projects that were deficient in all these aspects, and that the quality of preparation and appraisal had significantly more influence on satisfactory performance than key country macroeconomic variables, external factors, or government considerations (World Bank, 1996).

A move toward a greater emphasis on the front end of projects is being

shown in the public sector. Klakegg, Williams, and Magnussen (2009) discuss three frameworks for governance of public projects. In the United Kingdom, the Office of Government Commerce’s framework introduced the “Gateway 0” analysis (Office of Government Commerce, 2007). The one major section of the U.K. public sector that uses a different framework is the Ministry of Defence (MoD), which has had an “extended life-cycle,” with an extensive front end. The Downey report (Ministry of Technology, 1969) put the emphasis on the early stage of projects, giving percentages of time and money to be spent preproject. Two projects that were “triggering incidents” to better governance of MoD projects were TSR2 and the Nimrod Early Warning Radar projects, both cancelled after significant sums of money were spent on them. In Norway, the government quality assurance program (Concept, 2007) introduced an early QA1 process: the reference quotes, “[Former practice has] been shown to be not sufficient to ensure that the project concept is relevant to the needs of society, and that it is the best alternative to meet these needs . . . The choice of concept is the most important decision for the project and for the State as project owner. . . The basis for QA1 is to ensure that the choice of concept is subject to true political governance” (Norwegian Budget, 2005). These developments have also recognized a key issue for major projects—that they are established within a turbulent environment, where the idea of specifying a well-defined project goal, which remains constant, is often not applicable. Front-end planning needs to recognize and plan for this turbulence (e.g., by ensuring that Gateway 0s continue intermittently throughout the project).

However, many issues may arise to complicate this period of decision making. This article draws together some recent research to show the main themes that need consideration at this stage of the project. The article first

mentions the importance of identifying the most appropriate *concept*. Then there is a need for alignment between the project concept with overall corporate *strategy* and specific corporate *goals*. To achieve this, decision makers need to make *judgments about the future*. When calculating benefits and costs, *estimation* is affected by certain recurring issues of which decision making needs to take account. Finally, projects, once launched, do not travel a simple straight line but move into a *turbulent environment*; this raises issues of *governance* and, particularly, the maintenance of strategic alignment. And all this has to be done up front, when there is only *scant information*. This sequence is not a recommendation for a decision-making process, but simply a logical way to organize themes identified. So the article does not provide a single approach, let alone a single “recipe”: rather, it explores the issues involved in such decision making.

Concepts

In the context of projects, a “concept” is a mental construction meant to help solve a problem or satisfy a need. Concepts should be generic, in the sense that several concepts could be envisioned as alternative solutions to the same problem—all essentially different, in that they are not merely variants of one specific solution to the problem. A major challenge in the front-end phase is to identify and evaluate one or several viable concepts.

The concept is, in many ways, concerned with the business case. The focus is on economic and societal, rather than technical aspects. The absence of a concept-definition phase is a deficiency in many projects: the concept may be decided up front without considering alternatives; it could be the choice of one individual, or the result of political preferences or pressure. The zero alternative—proceeding without major changes or new investment—may not be scrutinized to the same degree as alternative concepts.

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It is the anticipated effect of a perceived project that should guide the choice of concept, rather than the present undesired situation. We do not have a strong tradition of identifying real alternative concepts as the basis for designing projects. As a result, subsequent analysis, deliberation, and decision making is restricted to the project level. Asking for several alternative, viable concepts, including the zero option, challenges creativity but might help to avoid ending up with a concept that is inferior compared to the present situation.

Strategy Drives the Project—Efficiency Versus Effectiveness

A project has to begin with the corporate, public-sector strategy. Projects and programs are mechanisms for bringing about changes—in particular, large one-off capital expenditures—so clearly there is a need to examine how strategy drives the definition of projects. It is important to look beyond the simple success criteria on which project management has traditionally concentrated—delivering the planned output within cost and schedule—to the value that a project can give. Morris (2009) quotes the famous IMEC study by Miller and Lessard (2001), who distinguish between efficiency and effectiveness of project success, the latter pointing to the value generated by the project. He notes that the projects in this study were much more efficient than they were effective. Samset (2009) takes this distinction further, quoting a five-fold success criterion, widely used in international development projects: efficiency, effectiveness, relevance, impact, and sustainability.

One example of a project viable in strategic terms, but inefficient tactically, is the University Hospital in Oslo, Norway (Samset, 2008a). Due to emerging new technologies and added responsibilities, captured during the engineering phase after the budget was decided, it was completed in 2000—a year behind schedule, with considerable cost overrun, adverse newspaper

reports, and a public inquiry. Cost overrun was considerable in absolute terms but was equivalent to only a few months' operational costs for the hospital, and therefore insignificant from a lifetime perspective. The overall conclusion after a few years of operation was that the University Hospital was a highly successful project, and it would perhaps be unfair to suggest that initial decisions should have been able to anticipate problems with a high level of precision.

More serious by far is when a project fails in strategic terms, even if it successfully produces the intended outputs. Strategic failure means that the choice of concept turns out to be the wrong one—the wrong solution to the problem at hand, or only a partial solution, sometimes creating more new problems than it solves. In some cases, the initial problem no longer exists once the project is completed. One such example is an onshore torpedo battery built inside the rocks on the northern coast of Norway in 2004 (Samset, 2008a). The facility was huge and complex, designed to accommodate as many as 150 military personnel for up to three months at a time. It was officially opened as planned and without cost overrun. It was closed down one week later by Parliamentary decision. Clearly, a potential enemy would not expose its ships to such an obvious risk: the concept had long since been overtaken by political, technological, and military development. What was quite remarkable was that this project, which can only be characterized as strategic failure, got little attention in the media, possibly because it was a success in tactical terms.

It is therefore essential to identify explicitly the strategy of the organization and ensure that the goals or objectives of any project will “further the sponsoring organization's chosen corporate strategy and contribute to its overall goals.” This is the recommendation of Cooke-Davies (2009), which looks at the front-end alignment of

projects. Morris (2009) also considers the strategy of the organization, and the importance of developing projects to pursue this strategy, with emphasis on the value that the project produces for the organization, rather than simple efficiency of execution. In order to do this, the organization's needs must be made explicit. Naess (2009) examines the relationship between needs analysis, goal formulation, and impact assessment, and includes some methods for needs analysis. This also highlights some recurring problems with current practices, both qualitative, particularly a lack of a view of the systemicity within the analysis, and biases in the quantitative analysis when estimating costs and benefits.

Clearly, getting this alignment right is critical to the value of a project. Samset (2009, p. 20) points out the seriousness of “when a project fails in strategic terms, even if it successfully produces intended outputs. Strategic failure means that the choice of concept turns out to be the wrong one.” Project management has been developing in this area for some time. Turner (1993) describes the importance of the alignment of business strategy and portfolio, or program, objectives. The *Gower Handbook of Project Management* has as its second chapter “Implementing Strategy Through Programmes of Projects” (Jamieson & Morris, 2008). Regarding guidelines, Morris (2009) points out that the U.K. Association of Project Managers’ “Body of Knowledge” now “emphasises context, strategic imperative, commercial drivers, technology, the traditional control functions, and, not least, people; hence, the whole of Section 1 is concerned with how projects fit within their business/ sponsor's context” (p. 44).

The use of the words “projects,” “programs,” and “portfolios” will not be debated here. Morris (2009) gives this some consideration and includes the view held by the Office of Government Commerce that a key benefit of program management is the alignment of

projects to organizational strategy (Office of Government Commerce, 1999). The track record of the projects discussed above shows that there is still some way to go, but at least these led us to concentrate on the critical issues.

The relationship between strategy and project management is not one way. Morris (2009, p. 42) describes how strategy implementation is accomplished with project management, but project management can also contribute to strategic management. He points out that project management's contribution "can add value to the emerging strategy and ensure that benefits are reaped from its realisation." The importance of project management in producing value for an organization is discussed later, in the section on governance within a turbulent environment.

Goals and Alignment

The front-end phase commences when the initial idea is conceived and proceeds to generate information, consolidate stakeholders' views and positions, and arrive at the final decision as to whether or not to finance the project. In order to succeed in strategic terms, planners need to have a broad and long-term perspective and allow different concepts to be considered. However, this broader perspective requires planners to look deeper into the future, where uncertainty is higher and conclusions more hypothetical and tentative, amplified by the fact that the front-end phase in large investment projects, particularly large public schemes, can extend over several years.

There is a need to identify corporate goals and objectives and to align projects despite the difficulty of this in practice. Roth and Senge (1996) describe management decision making in the real, complex world, classifying problems as "dynamic complexity," the underlying complexity of the problem situation itself, and "behavioural complexity," the complexity of the group effect. The dynamic complexity in the

underlying problem is overlaid, and sometimes dwarfed, by issues of different stakeholders having different perceptions of reality; different understandings of the problem; different assumptions, values, and objectives; and so on. Problems that are complex in both dimensions are known as "wicked messes."

Projects in a typical management environment, public or private, may frequently be in such a "wicked mess." As Linehan and Kavanagh (2004) note, "Projects are complex, ambiguous, confusing phenomena wherein the idea of a single, clear goal is at odds with the reality." Indeed, Engwall (2002) describes the establishment of the perfectly correct goal as a "futile dream."

Winter (2009, p. 125) quotes Morris: "at the front-end . . . we often have quite messy, poorly structured situations where objectives are not clear, where different constituencies have conflicting aims." He then provides a well-established methodology, known as "soft systems methodology," which was developed by Peter Checkland, for gaining understanding about such situations, and using this to direct the front end of projects. This methodology recognizes the subjectivity implicit in all human situations, including projects, and is able to develop learning and understanding at the start of a project. This subjectivity is also key to the ongoing execution of projects, as participants make sense of a project and work toward its delivery (Weick, 1995).

Considerations of goals are affected by the social geography of an organization, thus, the behavioral-complexity aspect of the "wicked mess" must be considered. Groups, by their very existence, influence decision making, and where strong structures or power gradients exist between members of an organization, decision making might become less rational. Perhaps the best-known effect is "groupthink" (Janis, 1973), where the individuals within a group conform in their thinking with what *they* think is the group consensus.

Equally well known is Habermas' theory of communicative rationality: where communication is dominated by discourse unfettered by the coercive use of power, there will be good exchange of rationality, but where power is being used to limit free communication, there might be failures in decision making (Habermas, 1984). In assessing how judgments are made about the future, consideration must also be given to the many aspects of the group of decision makers within an organization. This includes different levels of power, interest, and credibility; the difference between expressions and perceptions, the various aspects of social geography, and so on. Miller and Hobbs (2009) expand on this, stating that the project concept should meet the needs of many stakeholders, both those within the project organization and those in the wider environment. Furthermore, the development of the concept is related to the social process of building the project consortium.

The goals of the project—the benefits to be reaped—form a vital part of the business case. Cooke-Davies (2005) shows that many companies have difficulty stating that projects are "approved on the basis of a well-founded business case linking the benefits of the project to explicit organization goals (whether financial or not)." Many more are unable to state that they had a "means of measuring and reporting on the extent to which benefits have been realised at any point in time."

Judgments About the Future

Deciding organizational strategy is intimately related to making judgments about the medium- and long-term future. The merits of detailed strategic planning are disputed by Mintzberg (1994), Slevin and Pinto (1987), and Christensen and Kreiner (1991). Obviously, a long-term plan is less likely to be implemented without major change than a short-term plan. Detailed planning is less meaningful if the target lies far into the future. It is essential to

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have enough flexibility to respond to situations that might occur along the way (Floriciel & Miller, 2001). Planning should decide on the direction and strategic framework for a project, and anticipate difficulties that might occur, in order to prepare for and eventually make the right tactical choices.

A number of issues are involved in making such judgments, some of which occur as themes throughout the literature.

Firstly, the people involved are not supremely rational decision makers. Real managers are human beings and, at best, display “bounded rationality” (Simon, 1972). They are limited in the extent to which they can make a fully rational decision. Not only are they lacking complete information about the present, and have uncertainty about the future, but they are also limited in the extent to which they can solve complex problems. Indeed, as Miller and Hobbs (2009) point out, the assumptions underlying rational decision-making frameworks are often simply not valid in the circumstances of a real project. Thus, such decision makers adopt choices that are merely “good enough” or “satisficing” (Isenberg, 1991). Moreover, rather than evaluating projects from a single point at the beginning, with full information about costs and benefits, many project sponsors look at projects from “evolutionary perspectives” (Miller & Hobbs, 2009). Here sponsors are seen to act as champions, “shaping projects in response to” changes in the environment.

A further reason for bounded rationality, which particularly affects projects, is the existence of cognitive biases that are natural to humans. How these biases can be involved in estimating the costs and plans of projects is discussed in the next section. They also affect views of the future and the benefits likely to be gained from a project. Flyvbjerg (2009) offers extensive evidence of project benefit overestimation and cost underestimation. He describes

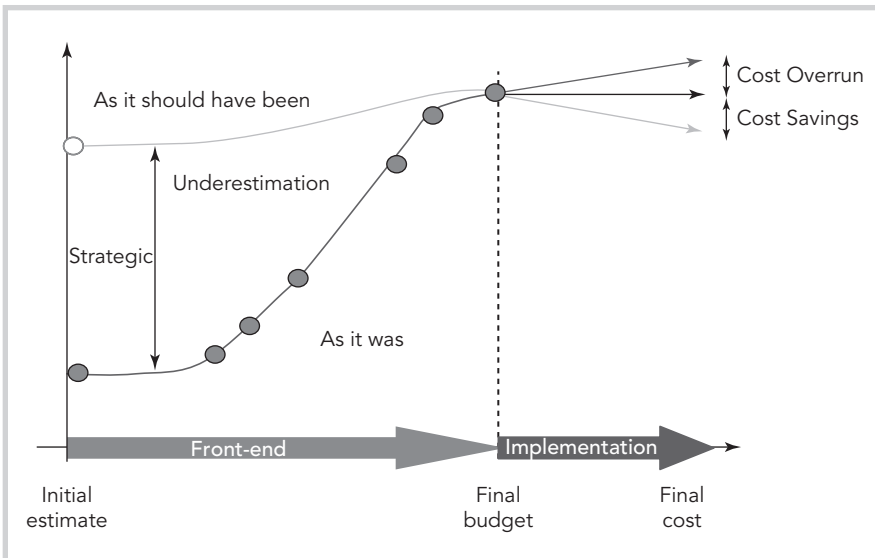


Figure 1: Up-front underestimation of costs, commonly more dramatic than implementation cost overrun [Samset, 2008b].

the biases involved, dividing them into technical (due to inadequate forecasting techniques or honest mistakes), psychological (“optimism bias”), and political-economic explanations (reasons to deliberately claim an optimistic view of the future). Much academic evidence for the middle category comes from the famous work of Kahneman and Tversky. Kirkeboen (2009) also looks at these “planning fallacy” biases, quoting the Sydney Opera House example. Pugh (2009) gives supporting evidence for such effects. Figure 1 of this article provides an additional explanation of why forecasts may be “excessively optimistic.” Large projects can be of very long duration, involving judgments far into the future. For the public sector, this raises issues about the role of the discount rate and the required social rate of return (Hagen, 2009).

A third aspect of the difficulty faced by boundedly rational decision makers in reaching judgments about the future is the systemicity and interconnectedness involved in the various aspects (the dynamic-complexity aspect of the “wicked mess”). Parnell (2009) discusses the complexity of project planning and looks at multiply related uncertain-

ties about the future. Van der Heijden’s methods (2009, p. 84) explicitly address this, “actively search[ing] for predetermined elements in the causal systemic network in which the project is embedded.” Naess (2009) also cites too narrow a needs assessment as a significant problem.

Finally, judgments about the future are, again, made within the social geography of the group or coalition, and are subject to the same effects of behavioral complexity discussed previously. Again, the methods outlined by van der Heijden (2009) take full account of the multiple perspectives and worldviews of the decision makers. The methodology covered by Winter (2009) concurs with this.

There is also the question of whether or not analysts’ advice is applied by decision makers. The normative model for decision making suggests that decision and analysis should follow in a logical and chronological sequence that will eventually lead to the selection and go-ahead of the preferred project, without unforeseen interventions or conflicts. In reality, the process is complex, less structured, and affected by chance. Analysis may be biased or inadequate. Decisions may be

affected more by political priorities than by rational analysis. Political priorities may change over time. Alliances and pressures from individuals or groups of stakeholders may change. Information may be interpreted and used differently by different parties, the possibility for disinformation being considerable.

Of course, judgments about the future are not one-off events at the start of a project but continue as it proceeds into the future. This will be discussed in the section on the turbulent environment of the project.

Estimating the Project

A key element of judgment about the project is the estimation of its cost and schedule—a fundamental part of project management, but one that seems to pose unique difficulties for major projects. While cost overrun is a question of doing the project right (efficiency), underestimation of cost up front might affect the much larger issue of choosing the right project (effectiveness). Flyvbjerg (2009) examines the various reasons behind the “pervasive misinformation” that persistently troubles project estimation—not only technical explanations, such as inadequate data or lack of experience, but the main headings of optimism bias and strategic underestimation of costs. In many cases, underestimation of cost is done on purpose: underbidding might significantly improve the chance of the project being considered. Once “on the list,” it stands a better chance of being implemented. Decision makers demonstrate a surprising degree of tolerance for what is accepted up front, without repercussion for the involved parties. This is so common that we talk not only of systematic underestimation, but also of normalization of deviance (Pinto, 2006). Ultimately, this implies a culture where fundamental requirements regarding reliability and validity of information are neglected, and decision makers no longer see a reason to trust the figures presented. This means that inferior projects that would

otherwise have been dismissed stand a better chance of being approved.

Underestimation represents a considerable problem, particularly in public investment projects. An inflation of the budget from the first estimate of 1000% or more is not uncommon. Cost estimates typically develop as illustrated in Figure 1. The plot often ends up in a characteristic S shape. Cost estimates are low in the initial period before the first systematic estimates of costs are undertaken. With time, the information basis improves, and the first surprises come to light. This, in turn, triggers greater focus on effort, and demands for greater openness and realistic estimates, often by independent appraisals. The cost estimate rises rapidly to the level at which it should have been at the outset. Thereafter, minor modifications are made until the final budget is approved. The dashed line at the top of Figure 1 illustrates the development of cost in the front-end phase as it should have been, had the process started with an estimate at a realistic level. The difference between the dashed and solid lines is called strategic underestimation.

Strategic underestimation is often of an entirely different order than the cost increases when the project is implemented, which might typically be in the range of 10–20%. Furthermore, it often leads to a “double dip” or “double jeopardy” effect, so that the project costs more than had it been estimated correctly (Williams, 2005). A further interesting observation is that cost overrun when a project is implemented may have considerable negative consequences for project managers, although it is unlikely that anyone will be made accountable for grave underestimation of costs up front. This problem is further compounded by overestimating benefits at an early stage, as depicted in Figure 2. The initial forecast is high, and may be scaled down during the front-end phase. After the project is completed, benefits, which may be expressed in terms of sales figures or market demand, prove to be much less than expected. After a period, the demand might increase and stabilize, establishing strategic overestimation of benefits. Of course, since the benefit/cost ratio is commonly used as a decision criterion,

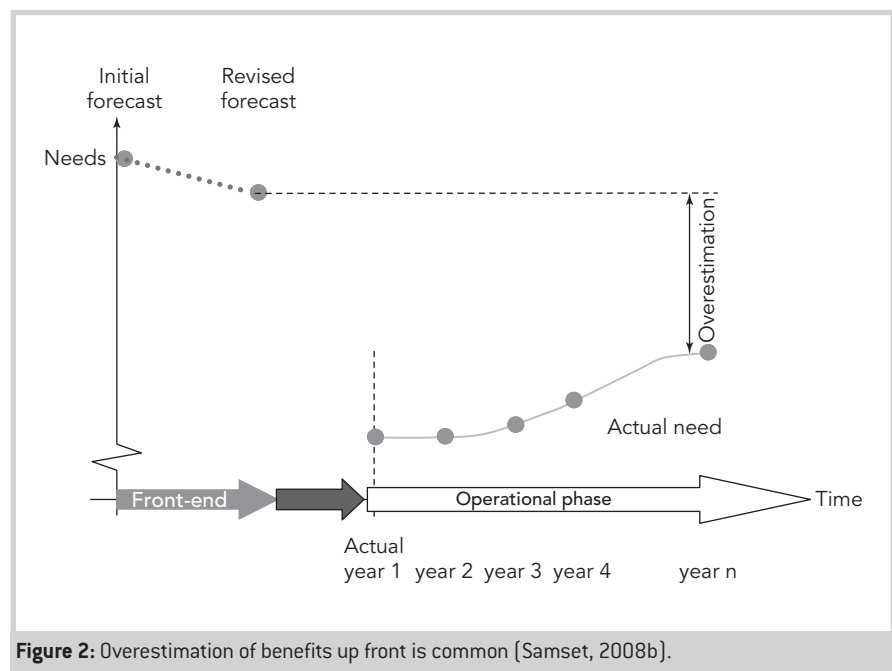


Figure 2: Overestimation of benefits up front is common (Samset, 2008b).

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the picture is distorted in favor of the project. A cost estimate half of what is realistic, combined with an estimate of benefit that is double, results in an anticipated benefit/cost ratio four times as high as it should be.

There is reason to believe that this type of bias, due either to errors or deliberate manipulation of information, is a prime reason why many poor projects are chosen. In some cases, the bias is so large that further consideration of the project would have been unthinkable had more realistic figures been presented in the first place.

In both types of estimation, the gap may be explained by two situations: systematic skewed estimation, which is often politically motivated, and errors due to flawed information and methods. Flawed information and methods may result in unsystematic errors—that is, errors in both directions. Whenever the estimates of several projects systematically far exceed reality, there is reason to suspect an imbalance, which can only be put right by an overriding requirement to make investigators and decision makers more accountable.

This should not discourage the use of human estimators. While the evidence of cognitive and political bias is well established, there is also much evidence of the skill of experts in using innate tacit knowledge to estimate projects. Scheibehenne and von Helversen (2009, p. 209) outline some well-known decision heuristics and conclude that, under the conditions of uncertainty about the future and systemicity encountered during the front end of project decision making, “heuristics provide a feasible way to make decisions. Contrary to the common view of heuristics as second-best solutions . . . the research program . . . has provided substantial evidence that heuristics often achieve an astonishingly high performance using just a fraction of the time and the amount of information required by standard decision strategies.” Indeed, the use of purely relevant information can make the heuristics more robust.

One key problem, ingrained in the lore of project managers, is the uniqueness of their projects. Project managers are accustomed to the definition: “A project is a unique venture with a beginning and an end, conducted by people to meet established goals with parameters of cost, schedule, and quality” (Buchanan & Boddy, 1992, p. 8). They tend to think of each project as unique—which it may well be in many aspects. However, this view can nearly always be balanced with evidence from past projects. Kirkebøen (2009) reiterates Kahneman’s idea, that this means taking an “outside” instead of an “inside” view of the project. Flyvbjerg (2009), when considering what planners can do about the biases he has identified, concentrates on this idea of the “outsider” view, to produce the idea of reference class forecasting. This technique is now well established in a number of countries. Parametric forecasting is discussed by Pugh (2009) and is based on his experience of applying this in the public sector. This is another method of trying to avoid the overreliance on project uniqueness, by bringing the evidence of past projects to bear on the project-estimation problem. It, too, is now common in a number of countries, particularly in the defense sectors.

The calculation of uncertainties and likelihood of risks is crucial to the estimation in any project. Wright, Bolger, and Rowe (2009) discuss the difficulties that humans—including so-called “experts”—encounter in making such assessment, and how estimation can be improved. This difficulty is particularly acute in projects, where much uncertainty is epistemic (due to a lack of knowledge) rather than aleatoric (due solely to probabilistic uncertainty). Bedford (2009) divides the areas of uncertainty further, into lack of understanding about the major uncertainties and their interactions; the degree of project uniqueness; and the way in which future decisions will affect outcomes. He describes some probabilistic models for exploring the first two of

these and aiding the third. The first of these—looking at interactions of risks, or risks under conditions of systemicity—is a significant problem in risk analysis. Parnell (2009) explores further the assessment of multiply related risks. Of course, in practice, estimates of uncertainty are made by groups, with all the same issues of “groupthink,” consensus, politics, and the like, as outlined earlier (Cooke, 2009).

Governance in a Turbulent Environment

The need to align projects with the strategy of the organization has already been discussed. It is the role of project governance to ensure this: “effective governance of project management ensures that an organisation’s project portfolio is aligned to the organisation’s objectives, is delivered efficiently and is sustainable” (Association for Project Management, 2002, p. 4). There is a growing interest in project governance, in the practical movements of governments and companies (Klakegg et al., 2009), in textbooks (Müller, 2009), and in professional societies (see, for example, Association for Project Management, 2002, 2007). Morris (2009) emphasizes the need for project governance to ensure that projects deliver strategic value.

The key point in this article, however, is that the environment in which most projects operate is complex and turbulent, and conventional project management is not well suited to such conditions, despite the attraction of project organization to companies in fast-moving environments seeking agility and responsiveness (e.g., Martinsuo, Hensman, Artto, Kujala, & Jaafari, 2006). Malgrati and Damiani (2002, p. 372) point out the irony by contrasting “one of the main reasons for the spread of project management in companies, namely environmental complexity and uncertainty . . . and exposure to external change,” with the philosophical underpinnings of traditional project management, concluding, “The Cartesian clarity of inner structures

clashes with the increasing porosity of projects to complex contexts that they seek to deny . . . The risk, in short, is that the idealistic ‘island of order’ may suddenly turn into a more realistic, very classic, ‘iron cage.’”

In order for projects to be aligned with organizational strategy—and stay aligned—it is important to recognize the turbulence of the environment, and build in the capability to cope with this turbulence at the start of the project. As Miller and Hobbs (2009) discuss, this is equally important when the project is being undertaken by a heterogeneous consortium, or group of organizations, where processes and structures need to be developed to deal with turbulence.

First, flexibility needs to be built into the project strategy, both in the front-end concept stage and later on. Olsson (2006) points to the need for tactical flexibility within a defined strategy, and Samset (2009, p. 32) warns of the danger in seeking predictability: “prediction [can] become a prescription . . . it shifts the decision-maker’s focus from finding the best solution to . . . [making] his own idea or prescription come true.” Premature lock-in to an inappropriate concept can be a major danger to project success.

It has already been suggested that projects are not a simple execution of well-developed plans but are often Weickian sense-making activities, as the project management team copes with ambiguity, uncertainty, and complexity (Weick, 1995). This sense making within ambiguity takes place within the turbulent environment, making the project management task that much more complex. Cicmil, Williams, Thomas, and Hodgson (2006, p. 679) contrast “traditional approaches based on rational, objective, and universal representations of the project with a phronetic analysis of the ambiguous, fragmented and political reality of project situations.” Front-end decision making has to develop a project strategy, while recognizing these ambiguities.

The governance framework thus has to recognize these realities of project life

and be sufficiently versatile to enable projects to adapt, be flexible, and avoid premature lock-in. When there is restrictive “straitjacket” governance, there is a danger of projects gradually becoming unaligned with organizational goals. Miller and Hobbs (2005) discuss design criteria that should be brought to bear when developing a governance regime for a megaproject, in light of the complexity of such projects. Their assumption is that these would contrast with the traditional concept of governance as a static, binary, hierarchical process. Governance regimes for megaprojects are time-dependent and self-organizing. Because the process is spread out over a long period of time, there is an opportunity to transform the governance structure as the project unfolds.

This is not to say that governance framework should be unstructured. As Biedenbach and Söderholm (2008, p. 125) note, “Organizations need to develop two somewhat conflicting capabilities—flexibility and controllability simultaneously.” At its simplest, there is a clear need for staging. The OGC’s “Gateway 0” analysis has already been mentioned as one example. This is designed to be repeated periodically, to ensure that, as an ongoing strategic assessment, during which the need for the program is confirmed, it is likely to achieve the desired outcomes. Morris (2009) discusses the role of staging and gatekeepers in the ongoing governance of a project.

Flyvbjerg et al. (2003) discuss ambitions and risks in megaprojects, using a large number of projects, and conclude that a main problem is risk negligence and lack of accountability on behalf of project promoters, whose main ambition is to build projects for private gain—either economical or political—rather than to operate them for public benefit. Their suggested cures are: (1) risk and accountability should be much more centrally placed in megaproject decision making than they currently are; (2) regulations should be in place to ensure risk

analysis and management is carried out; (3) the role of government should be shifted from involvement in project promotion to keeping an arm’s length away, and restricting its involvement in the formulation and auditing of public interest objectives to be met by the megaproject; and (4) four basic instruments should be employed to ensure accountability, by: (a) ensuring transparency, (b) specifying performance requirements, (c) making explicit rules regulating construction and operations, and (d) involving risk capital from private investors, the assumption being that their willingness to invest would be a test of the viability of the project.

Scant Information

Scheibehenne and von Helversen (2009) conclude that “less can be more,” and that having less information can actually help the decision makers. This is also emphasized by Samset (2009). A restricted, but carefully selected sample of relevant facts and judgmental information may be an advantage in the effort to establish a broad overall perspective, and to identify and test alternative strategies. Omitting details and less relevant information helps avoid “analysis paralysis,” when decision makers are presented with large amounts of detailed information too early in the decision-making process. Furthermore, Samset points out that accurate quantitative information tends to become quickly out of date, and he refers to the “half-life of information.” This is a problem, since the front-end phase in major projects may last for years, even decades, and include several parliamentary election periods with shifting governments. Klakegg et al. (2009) give examples of this in the realm of defense. It is clear that carefully extracted qualitative information about a well-thought-out project concept can provide reliable and valid input to the decision for the whole of the front-end phase.

Similarly, the exposition of parametric analysis by Pugh (2009, p. 331)

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enables the forecast to “concentrate upon total costs and avoid being drawn into excessive detail. To descend prematurely into detail is to base forecasts upon what is not yet known and can only be conjectured.” Scheibehenne and von Helversen (2009) also point to the danger that, in circumstances of uncertainty, risk, and unforeseen consequences, decision makers will give spurious credence to a decision made on the basis of detailed information.

It is also clear that bad project decisions have been made due to lack of information. Kharbanda and Pinto (1996, p. 181) refer to the decision making involved in the Sydney Opera House, where there was not “a basic design [or] a realistic estimate of time and cost involved. Feasibility analysis was almost non-existent.” However, it is an important theme of this article that when decisions are made at the very front end of a project—when uncertainty is at its highest, and available information most restricted—the lack of detailed information can actually be a benefit rather than a hindrance, in providing focus and flexibility to the decision maker.

Summary

This article considers issues affecting how decisions can be made at the front end of major projects, in circumstances where information is usually scant. It has not been possible to consider all elements of a front-end analysis here. These can be found in project management handbooks, and include features discussed here, such as strategic analysis, analysis of needs and benefits (Naess, 2009), and the business case, together with further elements, including stakeholder analyses, scenario analysis, value management, and risk analysis (Dallas, 2006; Eden & Ackermann, 1998; van der Heijden, 2009). Regarding scenario analysis, van der Heijden (2009, p. 69) states that “uncertainty can and should be on the agenda as part of the process of deciding on committing time and resources to an irreversible

process,” and pertaining to risk analysis, Edition 2 of the *PRAM Guide* looks specifically at the “known unknowns” (Association for Project Management, 2005). Depending upon which of the many differing interpretations is used as to where the “front end” ceases, other elements may include procurement strategy, initial design/time plans, and supply-chain analysis.

Front-end management and project governance are increasingly popular research agendas in the field of project management (Williams, Samset, & Sunnevåg, 2009). This article has tried to offer some insight into the complexity that confronts researchers. In summing up, a number of issues remain to be explored, but these are not an unrelated list of issues. There is indeed a need for alignment between organizational strategy and the project concept. But even when this is achieved, it is still necessary to deal with complexity, particularly the systemicity and interrelatedness within project decisions, as well as the ambiguity implicit in all major projects. Neither establishment of strategy nor major decisions are usually taken by individuals in isolation, so there is a need to consider the social geography and politics within decision-making groups and organizational consortia. When calculating benefits and costs, estimation is affected by certain recurring issues, particularly psychological and political biases, the latter again based within the social geography and politics of the group. So these different strands—identification of strategy, alignment of the project, scenario planning, and project estimating—are all rooted within the same set of organizational issues and need to be viewed as an integrative whole. Of course, this extends beyond the front end into the implementation stage, and how individuals and teams “sense make” during the project to try to realize the goal—after all, projects are carried out by groups of people, who will exhibit the effects resulting from the complex responsive relationships

between individual humans (Stacey, 2001), communicating and negotiating status and power relationships. Furthermore, this sense making occurs within the turbulent environment in which many modern organizations find themselves; front-end decision-making also requires the design of organizational and governance structures that will control (maintaining strategic alignment) with sufficient flexibility such complex projects in such environments. There has been much research into each of these steps individually. Clearly though, there is a need for further research into how different organizational forms and cultures with different project complexities and domains operate in all of these stages and the correlations between them. It is time to embark on a research agenda for producing front ends that result in the projects we actually want.

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