FEATURES OF A PROJECT

by Professor Dr. Knut Samset, Norwegian University of Science and Technology, and Director of the Concept research program.

THE PROJECT AS A MEANS TO ACHIEVE AN AIM

The project is a fairly recent phenomenon in history. Earlier, most tasks in society were handled by designated permanent organizations – be it the construction of a bridge or a road, arranging a cultural or a sports event, developing a new industrial product, solving a research problem or testing a new drug.

Over the last decades, however, projects have become increasingly important as a way to organise work. More than ever before, projects are used to solve big tasks of public utility. They operate across organisations, and are terminated when the planned task is completed. There has been a significant increase in the amount of such major projects – not least in sectors such as offshore, infrastructure and information technology. But projects are also organised within individual organisations. This means that their value added and profitability increasingly depend on successful projects.

A project is a temporary endeavour undertaken to create a unique product or service.

(Project Management Institute, PMI)

Organizations perform work. Work generally involves either operations or projects, although the two may overlap. Operations and projects share many characteristics; for example, they are performed by people, and planned, executed, and controlled. They differ primarily in that operations are ongoing and repetitive while projects are temporary and unique. Temporary means that every project has a definite beginning and a definite end. Unique means that the product or service is different in some distinguishing way from all similar products or services.

Projects are undertaken at all levels of the organization. They may involve a single person or many thousands. They may require less than 100 hours to complete or several million hours. Projects may involve a single unit of one organization or may cross organizational

Extract from the textbook ‘Project Evaluation. Making Investments Succeed.’

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A project is a means to achieve a goal by applying a certain amount of resources. Somewhere along the line there might be a need to undertake an evaluation in order to ascertain whether the project will be or has been successful. The tasks that projects are assigned to solve are defined in terms of more or less precise and realistic goals. Being a temporary arrangement, and also because the undertaking is more or less unique, uncertainty is often greater than what is common in permanent organisations. Because of the uncertainty associated with planning and implementation, the extent to which the project will attain its goal is also uncertain. This is one of the reasons why improved know-how and tools that can better the planning and management of projects are of great and increasing economic significance. It is also one of the reasons why there has been an increasing tendency to evaluate ongoing and completed projects.

Figure 1  A project is a means to achieve a goal by applying a certain amount of resources. Somewhere along the line there might be a need to undertake an evaluation in order to ascertain whether the project will be or has been successful.

There are numerous examples of projects that have caused high additional cost for the society both during and after they have been implemented. A comprehensive study of major projects, *Morris and Hough (1991)*, concludes that the track records of projects are fundamentally poor, particularly for the larger and more difficult ones. Overruns are common. Many projects appear as failures, particularly in the public view. It seems therefore that there is a contradiction between the increasing use of projects and the fundamental problem of projects often overrunning their budgets and exceeding their set limits.

However, in reality, most projects attain their objectives in one way or another, even if too many are made too expensive or are delayed. There are several reasons for the increasing use of projects today. One answer is that many tasks in society are so enormous and complex that individual organisations lack the competence or capacity to

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2 Based on 31 separate studies from the period 1959-86 covering more than 4000 projects
carry them out alone. This is particularly the case in small countries. Another answer is that the project focuses and visualises the task, and therefore has a motivating effect on all stakeholders. In projects, responsibilities are clarified and the different parties are made accountable. Moreover, the project is an expedient way of transferring risk from the financing to the implementing party. The project is also a conducive way of organisation, which allows participants to pool resources and co-operate towards a common goal.

**UNCERTAINTY AFFECTING PROJECTS**

Because projects are unique undertakings, they involve a degree of uncertainty. Uncertainty characterises situations where the actual outcome of a particular event or activity is likely to deviate from the estimate or forecast value. It follows that decision-making becomes more difficult as uncertainty grows. Further, that the availability of relevant information increases predictability and reduces uncertainty seen from the decision maker's point of view.

This is illustrated in Figure 2. In general, uncertainty would be highest at the earliest stage where the project concept is conceived and will reduce as time passes and information accumulates. A reasonable suggestion is then that the potential to reduce uncertainty and risk is largest in the outset and that it could be achieved by adding more information. Obviously, there are limits to this. Also, the illustration suggests that an evaluation conducted late in the implementation process would be of limited use to help reduce uncertainty.

Usually, the distinction is made between the value-neutral term *uncertainty*, and the *subjective* effect of uncertainty which may be either negative or positive seen from the point of view of different parties, usually termed *risk* or *opportunity*, respectively. Uncertainty can therefore also be seen as a source of motivation. For instance, a strictly pre-defined and predictable routine job provides few challenges and the motivation will
frequently be low. Increasing uncertainty may represent a challenge which motivates for improved performance. However, if uncertainty increases beyond a certain level where major parameters become unpredictable and the understanding and control over the project is lost, the motivation is commonly reduced.

Uncertainty may have many various causes, related to the situation itself, the design of the project, the time perspective, available information, the implementation of the project, etc. Ritchie and Marshall (1993).

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**Uncertainty**

- Uncertainty characterises situations where the actual outcome of a particular event or activity is likely to deviate from the estimate or forecast value
- Different stakeholders tend to view uncertainty differently, i.e. in terms of
  - risk – negative effects
  - opportunities – positive gains
- In general, people tend to view uncertainty negatively – and be risk-averse rather than risk seeking.
- The challenge is to systematically consider the opportunities inherent in an uncertain situation judged against the possible risk

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**INTERNAL AND EXTERNAL UNCERTAINTY**

In analysing uncertainty in a project, a useful distinction is between operational uncertainty and contextual uncertainty. Christensen and Kreiner, 1991. Operational uncertainty is basically associated with the implementation process itself and considered relatively independent of the context in which the project operates. It is characterised by such features as the quality of plans, management, staff qualifications and experience, project design, funding problems, etc.

The operational uncertainty may be high in an innovative development project which explores new ground, and low in a routine type project with many repetitive elements, extensive experience from similar processes and where the outcome is largely predictable. A characteristic with operational uncertainty is that it will be reduced as the process develops. To some extent it can therefore be reduced by increasing the amount of information available. It can also be reduced by establishing operational objectives at a realistic ambition level and through systematic, realistic planning.

Contextual uncertainty is associated with the surroundings or the context of the project. The contextual uncertainty would be high in projects operating in an unknown environment. Contextual uncertainty is linked to conditions or circumstances beyond the scope and authority of the project, for instance political processes, decisions and
responses in affected institutions, demands and responses in the market, technological development, price changes, etc. The possibility to influence contextual uncertainty is often limited. It is often the result of complex processes to a degree, which causes the information gap to be maintained despite effort to generate relevant information. The causes and effects of contextual uncertainty are more difficult to predict than for operational uncertainty.

Clearly, uncertainty will be a key parameter in project evaluation. In assessing the success of a project we combine the assessment of performance and the effect of uncertainty, precisely as explained above, in terms of operational and contextual factors that will have to be identified and broken down into operational indicators that can be measured.

<table>
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There is a widespread belief that success and uncertainty is related. Projects therefore go to great length to explore, understand, reduce or overcome uncertainty in decision-making. To this end, the most common means is to:
1. Generate and analyse as much essential information as possible
2. Take a broad view to understand the factors that affect the project
3. Reduce the level of ambition
4. Reduce the planning perspective in time, etc.
5. Improve planning, for instance by using stochastic analysis, etc.

However, as illustrated above, reality, at least outside the physical laboratory, is in constant change, and therefore more or less unpredictable. The reason for this is the in-built dynamism in social and administrative systems, particularly their self-adjusting abilities. There are obvious limitations to what can be achieved in terms of reducing uncertainty. As the result, minute plans developed at an early stage may be less effective in achieving objectives than successive interventions to influence the dynamic process as it unfolds. Systematic assessment of uncertainty at different stages could therefore be seen as an alternative or supplement to planning. It would also be an essential part of evaluation, both in the front-end when the viability of basic project concepts as assessed, and later when performance and effect are scrutinised.

THE PROJECT’S MAIN STAKEHOLDERS

Projects are implemented by project operators in accordance with a given budget and schedule. What is commonly termed the project perspective is often the perspective of the operator. However, this is misleading as there are several stakeholders that are parties to a project. Assessment of the success of a project must necessarily be associated with the interests of the project’s stakeholders.

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<th>ROLE</th>
<th>FOCUS</th>
<th>COMMON TERMS USED</th>
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<td>OPERATOR</td>
<td>Responsible for implementing the project, either by contract or on their own behalf</td>
<td>Project outputs</td>
<td>Implementing party, contractor, project manager</td>
</tr>
<tr>
<td>USER</td>
<td>Primary user of the (first-order) results or services of the project</td>
<td>Project goal</td>
<td>Target group, customer, beneficiary</td>
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<tr>
<td>FINANCING PARTY</td>
<td>The initiating party with an interest in the long-term effect of the project</td>
<td>Project purpose</td>
<td>Developer, project owner or financier</td>
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Project stakeholders are individuals and organizations who are actively involved in the project, or whose interests may be positively or negatively affected by the project. The key stakeholders are the financing party, the operator, and the users. Their roles and interests
are described below. The outline is simplified and does not take into account that there in many cases might not be a clear-cut distinction between the three groups. The financing party can, for instance, represent the society’s perspective in a project to construct a power plant, or could also represent the users in a residential housing project initiated by a housing association. In many cases, it is not possible to distinguish between the financing party and the operator in, for example, a project which is internal to an organisation. In other cases the operator may also be the key user of the project’s result.3

The operator will not automatically be concerned about the project’s possible effects on users and the society - unless explicitly defined in his contract. The operator is not likely to follow up on such aspects at his own initiative – and in any case if this might adversely affect cost, progress or other key management criteria. Equally, usage and effect criteria are notoriously difficult to follow up directly when the implementation is under way, because one can only measure the true effects after the results are in use.

Example.
Projects are often designed without and adequate analysis of the key stakeholders’ interests and needs: A tunnel project was implemented in order to connect a community on a small island with other islands in the region based on a rather diffuse motive of the financing party to promote economic development in remote areas. Important aspects such as the users’ ability and willingness to pay for the new infrastructure, or its usefulness for local industry were not properly assessed.

The project was successful from the contractor’s perspective, being built on time and with costs considerably below budget estimates. However, because of the island’s small population, it became apparent that the financial basis was insufficient and user toll correspondingly high. Also, that the connection to the mainland was not decisive for the industry. The size of the investment, combined with low revenue from toll fees made the project a heavy burden for local district authorities.

An analysis of how to interpret “regional development” could have restricted the project goal to the priorities of industry and uncovered that the real need was not for a road connection with the mainland, but for improved harbour facilities – which would have been economically viable.

A project is not necessarily successful in a broad societal perspective - even if the implementation is successful from both the perspectives of the operator (in terms of time, cost, and quality) and the user. Also, we cannot automatically assume that a project with major overruns in terms of time and cost and also with major quality flaws will come out as a failure when seen from the users or the society’s perspective. There are many examples of projects that have failed in the implementation phase have proven successful at a later point in time, when assessed in a wider perspective. One example is Sydney

3 In some cases, each of these parties might be represented by several individual stakeholders, who, in certain cases, are also legally or financially independent of each other. Therefore, not only do conflicts of interest arise between the different groups, but also within the groups themselves. In exceptional cases severe problems might occur just because of internal changes of personnel. It is easy to forget that we deal not only with organisations, but the representatives of these organisations, and that these not always act in a co-ordinated manner.

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Opera House, which started out with a six year time-frame and a budget of 7.2 million Australian dollars. In reality, it took over 16 years and 102 million Australian dollars to complete! Afterwards, the building has become an international attraction and has brought enormous financial gains both directly and indirectly and placed Sydney on the world map.

Experience from project management suggests that in order to succeed, one has to try to see the bigger picture, and strike a reasonable balance between the narrow and broad perspectives. In other words, to keep in mind the interests of both the operator, the user and the financing party. In project management, the focus has traditionally been on the contractor's perspective. One of the characteristics of evaluation is that it attempts to maintain the three perspectives in an broad, overall analysis.

THE STAKEHOLDERS’ INTERESTS IN THE PROJECT

The operator’s perspective

Project operators have their attention directed, first and foremost, towards the production of project outputs – focusing on the cost, time-frame and quality produced. In other words: the concern is the tactical completion of the project within the strategic frames which are laid down by the financing party.

This is often misleadingly termed as the project perspective. It is the most restricted and short-sighted perspective one can use when assessing projects. It refers to the lowest level in the project’s hierarchy of objectives, see figure 3. Take, for example, a road project, where the focus is narrowed down to the road itself, and the extent to which it is built according to the agreed quality standard, budget and schedule. The project outputs for a school construction project might correspondingly be restricted to constructing and outfitting the school buildings.

If focus is placed on the operator’s perspective alone, a number of problems can develop. Too much emphasis on the agreed time schedule, budget and so forth, could divert attention away from possible adverse side-effects of the project, which can, in the long run, bring about considerable negative reactions in society. Paradoxically, this can result in a much more costly solution, or reduced long-term economic gain as the result of the project.

The user’s perspective

Users are more concerned with the utility of the project seen from their point of view, and less with the actual implementation. They tend to assess the project from a broader perspective, with reference to the project goal. The parameters used to assess the extent of success are associated with the project’s first-order effects. Assessment, thereby, concerns how the project’s application and financial aspects affect the user. In a road construction project, such assessment to a certain extent concerns the technical quality of the road, but primarily whether the road makes it easier and quicker to travel from A to B, e.g: the distance and the flow of traffic. For a school construction project, the user’s interest goes beyond the suitability of the school buildings, and to the learning and teaching that takes place in the buildings. This, obviously, falls outside the operator’s sphere of responsibility. The user’s perspective is therefore more ambitious as regards both time and uncertainty, as is illustrated in Figure 3. The chance of success is
correspondingly more limited in relation to assessing the project from the perspective of the operator alone.

![Figure 3 Assessing projects from different perspectives as regards time and uncertainty](image)

**The financing party’s perspective**

The financing party normally has a perspective beyond the user’s perspective, or what is seen to be the immediate effect of the project. Society in general has a perspective that tends to include the collected effect of the project on society as a whole. This is what is termed the project’s *purpose*, which is the highest level and expresses the long-term consequences of the project. Private investors will normally place greater emphasis on the value added or profitability, while public investors would emphasise public utility.

In a road construction project, one is concerned with the positive economic effect on society, for example, as the result of reduced travel time, yielding more productive time, the establishment of new settlements or enterprises near the road and so on. In a school construction project, the long-term aim would focus on the effect of education in terms of employment, the economic effect of provision of goods and services, and so on.

In principle, the assessment is similar to that of the user, but now related not only to the primary “user-group” but also to the interests of other parties that are affected by the project, directly or indirectly. Such assessments are ambitious; since the time horizon is extended and uncertainty is higher than is the case of the other perspectives, see Figure 3.

**THE PROJECT IN A TIME PERSPECTIVE**

As discussed above, people’s perspective on a project is related to their roles and responsibilities. The financing party usually has a broader perspective on the project than the contractor, which is in turn broader that the sub-contractor’s perspective. If the
broad perspective is lacking at the highest level, one cannot expect that it will be present at lower levels. However, all parties need a comprehensive and precise picture of the project strategy that explains in precise terms what is expected to be achieved by realising the project outputs. This will make it easier for all concerned parties to help produce relevant information for managers at higher levels.

Figure 4 illustrates the project over time as seen in relation to the three planning perspectives outlined earlier. The idea is that the project represents a focussed undertaking where the primary objective is to produce a number of agreed outputs within a specified time-frame. Commonly, the project can be seen as a time-restricted part of a process with a wider purpose and a time perspective beyond that of the project. This process can be characterised by what is termed the project goal. The process in turn contributes to a broader and more long-term societal process, which in this context is characterised by what is termed the project purpose. This objective gives a concerted strategic perspective both for the project and the process that the project is part of. It is often the case that the process presupposes that several projects run concurrently or in sequence. The process, in turn, will be one of many processes that contribute to the long-term objective, here called the project purpose.

The project is planned in a front-end phase, which ends when the final decision is made to appropriate funds for the purpose. It is executed in an implementation phase, which ends when the project outputs are realised. Commonly, there is an operational phase of the project, which follows when the project outputs are realised, that is when the building is built, the road is constructed, etc. As shown in Figure 4, it can perhaps be more appropriate to view this phase as a part of the process which the project is part of. As discussed earlier, it is essential to distinguish between the project and the process, since both the objectives and the implementing responsibilities usually will be different in the two cases.

It follows from the illustration in Figure 4 that the time perspectives vary for the different parties. The operator could possibly have a time perspective of three to four years, and would wish to delimit his commitments to the period of the guarantee. The financing
party could have a much wider time perspective equal to the pay-back period or beyond, and will want to restrict his obligations to this period. For large infrastructure projects, the period could be between 15 and 20 years. The lifespan for that which has been constructed can be much longer. The society can thereby be obliged to maintain the built object for generations.

Economically, the front-end phase deals, to a greater extent, with the organisation of who bears the uncertainty and risk involved in the project. When the financing party has established the strategic framework for the project and the main terms that should guide planning and implementation, and has identified a qualified party to take on the responsibility for implementation, then it is implicit in the arrangement that he does not wish to manage the project in detail but hand the responsibility for the project and the risk over to the operator.

His concern would rather be to ensure that the project moves in the right direction. He should monitor the project and detect as early as possible which amendments would be necessary to secure that the project has its desired effect in a strategic perspective. The division of responsibilities between the financing party and the operator is commonly regulated by contracts to ensure a certain flexibility for the operator within the strategic framework laid down by the financing party.

The operator will, in the front-end phase be concerned first and foremost with estimating the right price in order to be able to carry out the work to a satisfactory level without too great risk and, at the same time, seeing a profit. What makes this transaction viable is that the transfer of risk comes at a price. A core part of the contract between the two parties implicitly concerns how to share and price the risk. This forms the basis for the sharing of responsibility, such that both parties can attain their goals either fully or in part.4

4 The division of responsibility should have reference to more than just the distribution of risk.
SUCCESSFUL PROJECTS

Projects are evaluated more frequently than institutions and other more permanent initiatives. This is because projects are temporary undertakings that are implemented in a confined period of time, where there is a desire to evaluate the outcome before the project is formally terminated.

A key issue in evaluation is to establish the degree of success of the project. However, success is a highly aggregated parameter. There are large variations in how it is defined and interpreted. A meaningful comparison of success rates in different projects can only be made if the definition and application of the concept is carefully explained in each individual project. This is often not the case.

The concept of project success has remained ambiguously defined both in the project management literature and, indeed, often within the psyche of project managers. Projects are often rated as successful because they have come in on or near budget and schedule and achieved an acceptable level of performance. Other project organisations have begun to include the client satisfaction variable in their assessment of project success. Until project management can arrive at a generally agreed upon determinant of success, our attempts to accurately monitor and anticipate project outcomes will be severely restricted.

Pinto and Slevin, 1988

However, assessing success is not only a question of choosing the right parameters. It will also largely depend on which ambition level is used as reference when the project is evaluated.

A restricted interpretation of the concept is to look at success in an operational perspective where it is measured according to whether (1) the project was completed on time, or (2) the costs did not exceed the budget, or (3) the quality of its outputs met with expectations. These are the most commonly applied measures of success. A more compound measure of success in the operational perspective would be an aggregate based on these three (or more) parameters. Obviously this would narrow the chance of success considerably, as indicated with the shaded area in Figure 5.

A broader interpretation of the concept would encompass the tactical perspective and focus on the extent to which the project (1) has achieved its formal goal, or whether (2) the impact of the project is predominantly positive, or whether (3) the project is relevant in relation to people’s needs. Clearly, these measures are more ambitious and there is more uncertainty involved. Realisation of these measures can only be expected at a later stage. The aggregate of the three components would measure the usefulness of the project rather than its performance during implementation, and hence more ambitious. Therefore, the chance of success would also be less, as indicated by the shaded area.
The broadest interpretation of project success is associated with the *strategic* perspective, which could be based e.g. on measures of (1) the long-term economic effect in the broadest sense, (2) the extent to which it can be *sustained* in the long term, and (3) whether it satisfy *needs*. This is the society’s perspective. Obviously these are even more ambitious and aggregated measures with a correspondingly lower chance of realisation. By combining these measures as indicated by the shaded area in Figure 5, the chance of success is even more restricted.

It follows from figure 5 that the chance of success of a project is highly dependent on what time in the project cycle the evaluation takes place. During implementation it is usually possible to establish with some confidence whether the project will succeed in the operational perspective; more so the closer we get to the completion date. A reliable assessment of success in a tactical or a strategic perspective will have to be made at a later stage.

To confuse the picture further, projects have a tendency to change both ambitions and performance over time. In such cases, its success as measured against operational, tactical and strategic objectives may change considerably. In literature, success rates are often discussed and even compared without any reference to what stage in the project cycle the projects have been evaluated. This problem further limits the possibilities to make valid comparisons of success between projects.