Project Success

Pre-Publication Text
Handbook of Managing Projects

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Project Success

Introduction

Few topics are more central to the art and science of managing projects than "project success". It would seem to be self-evident that every person involved in the management of a project will be striving to make it successful. In the world of the twenty-first century "success", like its close relative "winning," seems to be an unquestioned "good." So surely there can be nothing too difficult about measuring project success?

Unfortunately, behind this rather obvious-sounding question, there lies a seething mass of complex assumptions and inter-related concepts that have led one author almost despairingly to ask, "Measuring success - can it really be done, and if carried out, what purpose does it serve?" (De Wit, 1988). Difficulties abound for many reasons: the different viewpoints, interests and expectations of groups of stakeholders involved in any given project; the subjective nature of perceptions of "success;" the tendency of perceptions to evolve over extended periods of time; the difficulty of assessing complex phenomena using simple metrics - the list is a lengthy one. On closer examination, project "success" turns out to be a rather slippery subject!

And yet the need remains. Every project is undertaken to accomplish some purpose, and it is both natural and right to seek to assess the extent to which that purpose has been achieved. Equally, if the art and science of project management is to advance, then practices that lead to success are to be encouraged over those that lead to failure. Indeed, these two aspects of the need to understand project success each lead to a different aspect of the topic that will be covered more fully in this chapter. Success criteria are the measures against which the success or failure of a project will be judged, and success factors are those inputs to the management system that lead directly to the success of the project. Each is important, but the two should not be confused.

A Brief Survey of the Literature on Project Success

Many of the practitioner-focused textbooks on project management define project success criteria in terms of the time, cost and product performance (expressed as quality, or scope, or conformance to requirements) compared to the plan. Indeed, this is so widely accepted that one popular book aimed at practitioners is sub-titled "How to plan, manage, and deliver projects on time and within budget" (Wysocki, Beck, and Crane, 1995). As a headline, it commands attention, although in the body of their book the same authors acknowledge the need to define success criteria more completely during the early stages of project definition. The difference of emphasis, however, serves to highlight a distinction that is well expressed by De Wit (1988), who differentiates between the success of project management (for which measures of time, cost and quality might be broadly appropriate) and the success of the project, which will depend on a wider range of measures. This distinction is important, although often ignored.

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The importance of the distinction is emphasised by Munns and Bjeirmi (1996), who draw attention to the short-term goals of the project manager (in delivering the required product or service to schedule and within budget) as opposed to the long-term goals of the project (to deliver the promised business benefits). Kerzner makes a similar distinction between "successful projects" and "successfully managed projects." "Successful implementation of project management does not guarantee that individual projects will be successful . . . Companies excellent in project management still have their share of project failures. Should a company find that 100 percent of their projects are successful, then that company is simply not taking enough business risks" (Kerzner, 1998; p. 37)?

De Wit, as it happens, is following Baker, Murphy and Fisher's classic analysis of 650 completed aerospace, construction and other projects (1974), which was subsequently developed further by the same authors (1988). They concluded (p. 903) that "if the project meets the technical performance specifications and/or mission to be performed, and if there is a high level of satisfaction concerning the project outcome among key people in the parent organisation, key people in the client organisation, key people on the project team and key users or clientele of the project effort, the project is considered an overall success." A definition that includes elements of both project management success (technical performance specifications; satisfaction of key people on the project team) and project success (meets mission to be performed; satisfaction in parent and client organization).

This tendency to blur the distinction is also followed in work subsequent to Baker, Murphy and Fisher by authors writing both before and after De Wit's article. Morris and Hough (1987), for example, in their seminal work on major projects make a convincing case for the popular perception that an excessively large number of "major projects" are perceived by the public to fail, and then argue on the basis of both a comprehensive survey of the literature and also eight meticulously conducted case studies for three or possibly four dimensions to project success criteria: project functionality, project management, contractors' commercial performance, and possibly, in the event that a project was cancelled, was the cancellation made on a reasonable basis and the termination handled efficiently. Project functionality, as defined by Morris and Hough, includes an assessment of both project technical performance which forms a part of "project management success," and other aspects of performance, which presages the much more recent language of benefits management.

More recently, a survey of 127 Israeli project managers (Shenhar, Levy, and Dvir, 1997) concluded that there are four dimensions to project success; project efficiency (broadly De Wit's "project management success"), impact on customer, business success and preparing for the future. The latter three fall within De Wit's category of "project success," as well as being remarkably similar to Baker, Murphy and Fisher's conclusions.

A backdrop to the discussion on success criteria is provided by an understanding of the different parties to the project that have a legitimate interest in its success or failure. Baker, Murphy and Fisher (1988; pp. 903ff) emphasise the importance of perceptions and name the "client" and the "parent" in addition to the project team. Morris and Hough (1987, pp. 194ff) refer to "sponsors," contractors, owners, regulators, financiers and governments as well as citizens and environmentalists. DeWit (1988, pp. 167f) reviews the breadth of possible project "stakeholders," as

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does Geddes (1990). Authors generally acknowledge that each stakeholder group can have different criteria for the success of the project, thereby introducing greater complexity to the subject.

The literature on project success factors is more extensive than that on success criteria (Crawford, 2001), although much of it is based on anecdotal evidence or studies with very small sample size: The state of current understanding can perhaps best be illustrated by considering three representative studies: Baker, Murphy & Fisher's (1988) considered findings from their analysis of 650 aeronautical, construction and other projects; Pinto and Slevin's studies (1988b; 1988a) of answers provided by 418 project managers from various industries, and Lechler's survey (1998) of 448 projects in Germany. These three have been chosen as representative because of their large samples of empirical data, because they include projects from different industries, because they use complementary data analysis methods, and because they cover the past three decades, during which time 99% of all the articles published about project management have been written. (Kloppenborg and Opfer, 2000)

Baker, Murphy and Fisher

Baker, Murphy and Fisher adopted the definition of success that has already been cited above. It includes a number of factors, and the perceptions of success of different groups of stakeholders. Their conclusion is that there are 29 factors that strongly affect the perceived failure of projects, 24 factors that are necessary, but not sufficient, for perceived success, and 10 factors that are strongly linearly related to both perceived success and perceived failure (i.e. their presence tends to improve perceived success, while their absence contributes to perceived failure).

The output measure (whether the project was successful or not) was a simple categorization of projects into three success "bands", based on a multiple of the factors contributing to their definition of success, which has already been discussed.

The ten factors are set out below.

1. Goal commitment of project team.
2. Accurate initial cost estimates.
3. Adequate project team capability.
4. Adequate funding to completion.
5. Adequate planning and control techniques.
6. Minimal start-up difficulties.
7. Task (vs. social) orientation.
8. Absence of bureaucracy.
9. On-site project manager.
10. Clearly established success criteria.

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Pinto and Slevin

Pinto and Slevin derived from Baker, Murphy and Fisher an understanding of the factors that influence project success, and then developed from it a more explicit definition of the criteria for judging project success (See Figure 1).

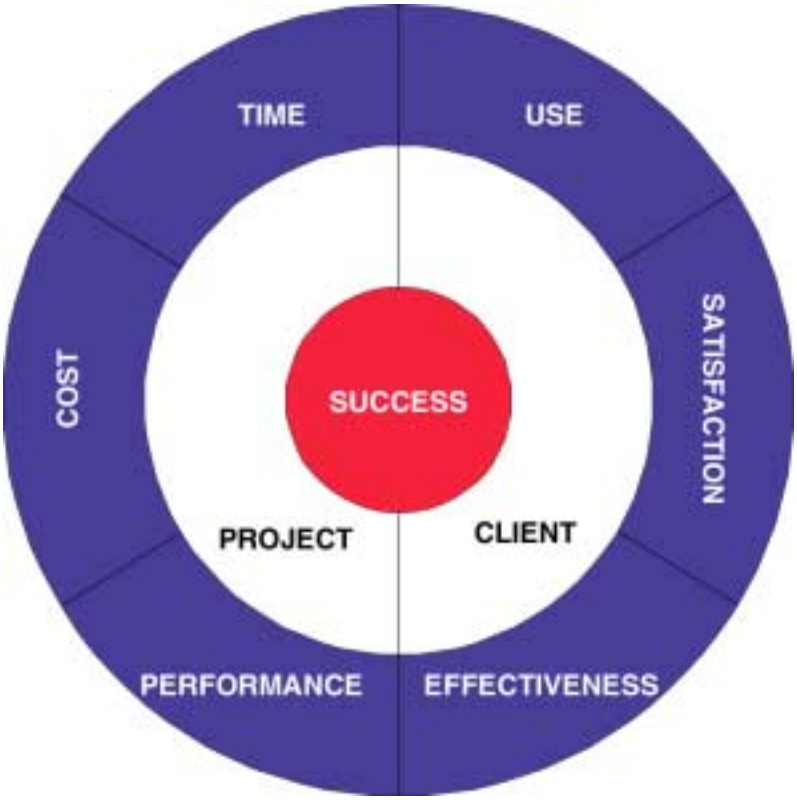

Figure 1: Pinto & Slevin's Model of Project Success Criteria (1988a)

They then assessed the opinions of 418 PMI members who responded to a questionnaire about which factors were critical to which elements of project success (just over half of them were project managers and nearly a third were members of project teams). They also related the results to the particular phase of the project's life cycle within which each of the factors were significant, using a simple four-phase model: conceptualization, planning, execution and termination. Participants were instructed to (Pinto and Slevin, 1988a; p. 70) "think of a project in which they were involved that was currently under way or recently completed. This project was to be their frame of reference while completing the questionnaire. The four phase project life cycle . . . was included in the questionnaire, and was used to identify the current phase of each project."

The results identified ten "critical success factors," which were then developed into an instrument to allow project managers to identify how successful they were being in managing their project. The ten factors are listed below.

1. Project mission - initial clarity of goals and general direction.

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2. Top management support - willingness of top management to provide the necessary resources and authority/power for project success.
3. Project schedule/plans - a detailed specification of the individual action steps required for project implementation.
4. Client consultation - communication, consultation and active listening to all impacted parties.
5. Personnel - recruitment, selection and training of the necessary personnel for the project team.
6. Technical tasks - availability of the required technology and expertise to accomplish the specific technical action steps.
7. Client acceptance - the act of "selling" the final product to its ultimate intended users.
8. Monitoring and feedback - timely provision of comprehensive control information at each phase in the implementation process.
9. Communication - the provision of an appropriate network and necessary data to all key factors (sic) in the project implementation.
10. Trouble-shooting - ability to handle unexpected crises and deviations from plan.

Lechler

Lechler, in the most recent of the three empirical studies, also started from an analysis of the literature. His starting point was that "cause and effect" is rarely taken into consideration, but rather that the "critical success factors" are analyzed as separate, independent variables. He reviewed 44 studies, covering a total of more than 5,700 projects and from them deduced that 11 discrete key success factors could be identified. Out of these, he chose the eight that were most frequently cited for his own empirical analysis.

Working from Pinto & Slevin's questionnaire, Lechler isolated 50 questions that corresponded to his chosen eight critical success factors, and distributed it to members of the German Project Management Society (Gesellschaft für Projektmanagement - GPM). Each respondent was sent two questionnaires and asked to complete one for a project that they considered to be successful, and one for a project that they considered to be unsuccessful. They were invited to assess the project as successful if "all people involved" regarded the process (social success), the quality of the solution (effectiveness) and the adherence to time and cost objectives (efficiency) as overall positive. A total of 448 questionnaires were received and analysed, 257 of them relating to "successful" projects, and 191 to "unsuccessful" ones.

The first step in Lechler's analysis was to seek correlations between individual technical factors included in the questionnaire and overall project success. Only four factors were found to have significant correlations:

- The appropriate technology (equipment, training programmes etc.) has been selected for the project.
- Communication channels were defined before the start of the project.

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- All proceeding methods and tools were used to support the project well.
- Project leader had the necessary authority (a composite of four different questions)

The second step in the analysis was to carry out a LISREL analysis (Linear Structural Relationships) for the eight critical success factors. This resulted in the path diagram shown in Figure 2.

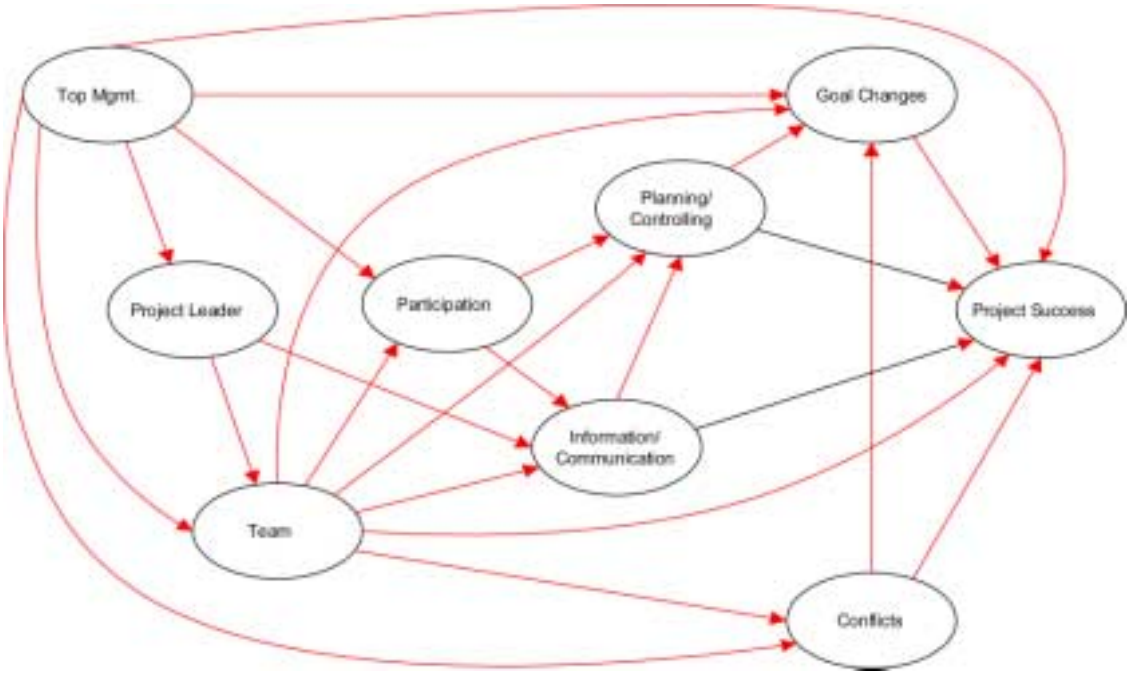

Figure 2: Lechler's Causal Analysis

Weightings were calculated for the various different paths of "causality" which, cumulatively, gave a value for r2 of 0.59: 0.47 from the "people" factors (top management, project leader and project team), and only an incremental 0.12 from the "activities" (participation, planning and control & information and communication) and "barriers" (conflicts and changes of goals). Lechler indicates the importance that he attaches to this conclusion through his choice of title for the paper - "When it comes to project management, it's the people that matter."

The weighting given to each of the eight factors was a follows:

Factor	Direct	Indirect	Total
Top Management	0.19	0.41	0.60
Project Leader	-	0.18	0.18
Project Team	0.16	0.36	0.52
Participation	-	0.10	0.10
Planning/controlling	0.16	0.01	0.17
Information/communication	0.12	0.06	0.18
Conflicts	-0.21	-0.08	-0.29
Goal changes	-0.20	-	-0.20

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The Three Studies in Summary.

The three studies show a certain commonality. Each of them emphasises the importance of clear and doable project goals, of careful and accurate project planning, of adequate resources provided through top management support, and of what would today be referred to as stakeholder management. Perhaps this is not too surprising, since each of the latter two builds on the earlier work. What it has meant, however, is that these factors have become "accepted wisdom" within the world of project management practice. There are, moreover, some serious questions to be asked about how generally valid the results are for all types of projects under all circumstances. After all, each study ultimately employed a single "composite" criterion for success, and based conclusions about the extent to which it was achieved on the answers provided by the same respondents who identified the role of different factors in contributing to that success. Further discussion is clearly called for.

Distinguishing Three "Levels" of Success

Regardless of what criteria are used to assess project success, and even with the broad agreement within the literature on the kinds of factors that are essential pre-requisites to success, the fact must be faced that a disproportionately large number of projects are unsuccessful (Morris and Hough, 1987; O'Connor and Reinsborough, 1992; KPMG, 1997; Cooke-Davies, 2001). This suggests that there is something missing from the debate on project success, and continuous action research with more than seventy multinational or large national organizations in USA, Europe and Asia-Pacific suggests that even the distinction between project success and project management success may be insufficient (Cooke-Davies, 2002a).

It has been argued elsewhere that the question of 'which factors are critical to project success depends on answering three separate questions: "What factors lead to project management success?" "What factors lead to a successful project?" and "What factors lead to consistently successful projects?"' (Cooke-Davies, 2002a, p185). The same article describes the relationship between business success and project success.

So what can be gained by regarding these three questions as pertaining to three different "levels?" Are there essential characteristics that can be used to distinguish each level from the other two? Or is this simply another conceptual framework to further bedevil a field of practice that already could be said to suffer from a surfeit of conceptual models along with a paucity of empirical data? The answer to these questions will emerge as each level is considered in turn, first, in the next section, with regard to success criteria and then subsequently with regard to success factors.

Three levels of success criteria

1. Project management success - was the project done right?

This is the measure of success that has dominated the practitioner-oriented literature on project management. In the folklore of the project manager it is about managing time, cost and quality. In

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reality, project objectives are rarely this simple. There will often be a business case to be borne in mind or a gross profit to be made; there may be health, safety and environmental objectives to be accomplished; if the project is a technical one, or a "platform" new product development, there could be scientific or technical goals to reach. Nevertheless, the principle is simple: once the objectives of a project have been clearly defined and the constraints spelled out, then the project manager and her or his team can use their best endeavours to deliver the project so that it meets the objectives within the constraints. If anything changes, which is likely given the inherent uncertainty that is involved in any new endeavour, then techniques such as project risk management and project change control can be called into play as appropriate. As a guided missile seeks its target, adjusting its trajectory as appropriate along the way, so the project team seeks to achieve the project objectives. Is this then an appropriate level at which to measure the success of a project? There are three different kinds of arguments that suggest that it is.

Firstly, modern project management has developed from a base of managing relatively "discrete" projects, each with its own organization, and each established to accomplish specific purposes (Morris, 1994). The kind of success criteria that are broadly used as measures of "project management success" have not only been those most commonly applied in the history of project management (e.g. "A Guide to the Project Management Body of Knowledge": PMI, 1996), but they also allow the project team as a coherent organizational unit to be accountable for its own performance and the practice of aligning accountability with authority is one of the well-attested principles of good management practice.

Secondly, the underlying concept behind measuring success at this level is based on the well-understood principles of first-order cybernetics (Schwaninger, 1997) in much the same way that a thermostat or a guided missile operate. This is clearly appropriate for projects in which both the goals and the methods of achieving them are relatively clear at the outset (Turner and Cochrane, 1993). Thirdly, the capture of data about the extent to which projects within the same enterprise are successful in terms of project management success enables the enterprise to compare and contrast the practices that are generally associated with successful projects with those associated with unsuccessful ones. This in turn provides the enterprise with valuable information about which project management practices are in need of improvement within project teams.

These are convincing arguments that support the case for continuing to measure project management success for many projects in many organizations. It is far from being the whole story, however, and for the second level of success it is necessary to turn to the second of De Wit's levels - what he calls "project success".

2. Project success - was the right project done?

This level of project success is perhaps the one that is of most interest to the owner or sponsor of the project. It is, in a sense, a measure of "value for money" in its broadest sense. The assumption is that the project will be successful only if it is successfully operated, and delivers the benefits that were envisaged by the people and organizations (i.e. the stakeholders) that agreed to undertake the project in the first place. In an attempt to isolate those core elements that are central to the way a project manager thinks about his or her work, a detailed analysed of the topics contained in six recent "bodies of knowledge" (Cooke-Davies, 2001, pp 51 to 90 and Appendices P1 and P2) has

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shown that they can be clustered into eleven topic areas, and related to each other in narrative fashion through a "systemigram" (See Figure 5 below). Viewed in this way, it becomes clear that "anticipated benefits" become the touchstone not only for formal "stage gate" reviews of projects, but also for the continuous "informal assessment" of the likely success of projects carried out by owners, sponsors or senior management, and influencing decisions about priorities and resource allocation.

Comparison of the eleven topic areas with previously published research about project success reveals a silence about "benefits" (Cooke-Davies, 2001 p90, Figure 7) perhaps because little has been written about benefits management or benefits realization until recently, and perhaps because the subject of "benefits" has been subsumed in the general discussion about "project purpose" or "project goals." Nevertheless, there are three reasons why this is an appropriate level at which to measure the success of a project separately from the first level that was discussed, project management success.

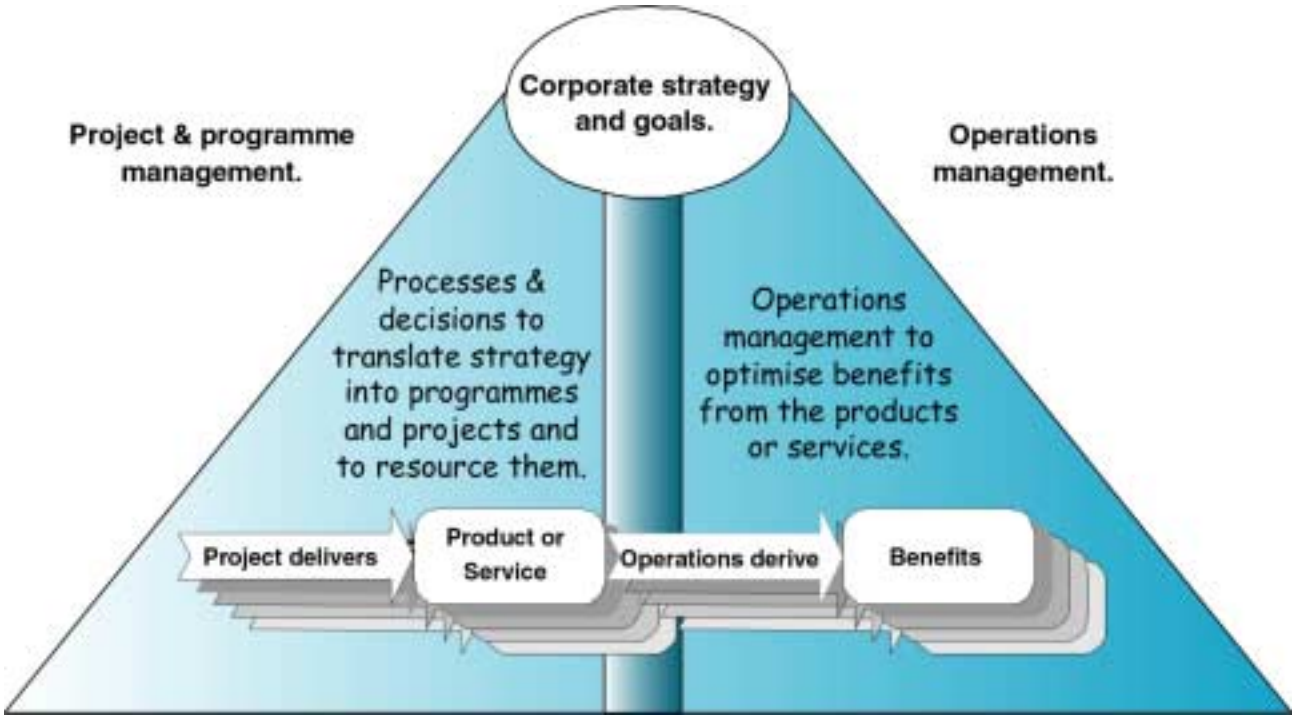

Figure 3: The involvement of both project management and operations management in the achievement of "project success".

Firstly, as Figure 3 shows, benefits are not delivered or realised by the project manager and project team, they require the actions of operations management. This calls for a close co-operation between the project team on the one hand and the "sponsor," "customer" and/or "user(s)" on the other. Thus the discussion of project success involves dialogue with a wider cross-section of the organization than is appropriate or necessary for project management success. Secondly, delivering project success is necessarily more difficult than delivering project management success, because it inevitably involves "second order control" (both goals and methods liable to change) and thus brings into play an additional set of corporate processes to those that are involved in delivering project

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management success. And thirdly, the extent of project success is unlikely to become clear during the life of the project itself, whether success is measured quantitatively in terms of financial benefits or qualitatively in some less tangible form. For these three reasons, project success is itself a viable level at which to establish success criteria.

It is not being suggested here that project success is somehow a "better" level at which to establish success criteria. Both project success and project management success are important to any project. If a project achieves project success without project management success, there is the inevitable conclusion that even greater benefits could have been realized. On the other hand, if project management success is achieved without project success, then the owner or sponsor has failed to obtain the benefits that the project was designed to provide. And that brings us to the third level of success.

3. Consistent project success - Were the right projects done right, time after time?

As the focus moves from project management success, through project success to consistent project success, a completely new set of criteria come into play, as adjudged by different groups of stakeholders. Projects are the means by which all organizations accomplish business change, as well as the means by which some organizations deliver profits to their shareholders. The consistency with which projects accomplish both project success and project management success is thus a matter of interest to every organization that is competing in markets for scarce resources, such as customers or finance.

At this level, a discussion of the criteria by which consistent project success is achieved is one that embraces the whole organization, and that will inevitably be influenced by its chosen strategy. For operations-driven organizations (such as financial services companies, or mass manufacturers) consistent project success in such areas as effective overall IT expenditure and new product development can lead to competitive advantage. For project-based organizations (such as engineering contractors, defence suppliers or turnkey IT systems providers), consistent project success can lead to profitable expansion. In either case, as the proportion of total work that is carried out in the form of projects increases, so consistent project success assumes an increasing strategic significance.

In recent years there has been a growing interest in project portfolio management for new product development (e.g. Cooper, Edgett, and Kleinschmidt, 2001), specifically for R&D (e.g. Matheson and Matheson, 1998) or generally for project spend in organizations (e.g. Artto, Martinsuo, and Aalto, 2001). But many organizations, particularly in traditional project-based industries, do not adopt a portfolio approach. For such organizations, as for all others, the effective and efficient use of scarce resources (particularly, but not only, people and money) remain of paramount importance. Thomas and Jugdev (2002) in their award-winning article on project management maturity models emphasise that long-range competitive advantage is enjoyed by those organizations that make the best use of their strategic assets (i.e. resources). Further, although they conclude that maturity models are not in and of themselves sufficient to enable organizations to capitalise on their intangible assets, such as strength in project management. They do, however, go some way towards establishing the value of "project management maturity" as a further criterion of success at this third level.

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A word about project metrics

One practical implication of this discussion of three different levels of success criteria is that an organization would do well to monitor its performance using a "suite" of project metrics that incorporates all three levels of success, if it is serious about understanding and improving its success in the field of projects. As figure 4 shows, each of the different levels of success is of interest to different levels of the corporate hierarchy, and each is visible after different amounts of time have elapsed relative to the project duration. No significant studies have as yet been published about the nature and extent of project metrics, although Atkinson (1999) and Lim and Mohamed (1999) each argue that the need for multi-layered project success criteria is intimately linked to the need for more comprehensive metrics. Unpublished research (Egberding and Cooke-Davies, 2002), however, indicates that very few organizations are happy with the metrics that they use.

Figure 4: Measurement of Project Success - Organizational Commitment and Time Elapsed.

After considering which factors influence success at which level, a framework for a hierarchical suite of metrics will be suggested at the conclusion of this chapter.

Factors contributing to success at each of the three levels.

Although much has been written about project success factors, the distinction between different "levels of success" is a recent addition to the conceptual language of the project management

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research community. The predominant tenor of the discussions is to construct (or, at worst, to imply) some overall measure of "success" and then to establish by primary research, by secondary research or by personal observation those factors that seem to correlate to success or to failure. The three chosen examples from the literature that were reviewed earlier in this chapter illustrate this point (Baker, Murphy and Fisher, 1988; Pinto and Slevin, 1988a; Lechler, 1998). This is not the only criticism that can be levelled at the whole body of research into project success. Much of it uses survey techniques to collect answers from respondents both about the success or failure of individual projects, and about the factors that contributed to that success or failure. It is thus better presented as research into the opinions of the project management community about success factors than as absolute success factors themselves. That is not to say that it is not useful - it is - but it is less useful than could be wished for.

Lest the pendulum be pulled too far in the opposite direction at this point, it is worth reflecting on the danger of what accountants call "spurious accuracy" in quantitative research into project success. Any assessment of project success will be carried out by specific stakeholders at specific times, and this will inevitably be influenced by many factors that are not directly related to the project itself. Business transformation or new product development projects, for example, may well be at the mercy of unforeseen and even unforeseeable developments that an assessor may or may not to take into account when judging success. And the longer the delay between project initiation and the point of assessment, the more difficult it becomes. It can be very difficult to distinguish between "luck" and "success" for any single project!

This is not a counsel for despair of ever producing any useful quantitative data - other "soft" science disciplines such as economics suffer from the same difficulties. But it does suggest the need to discern patterns or "laws" within large quantities of data, and thus as a prerequisite to create semantic frameworks that allow data to be compared on as near as possible a "like for like" basis.

Morris and Hough (1987), Belassi and Tukel (1996) and Crawford (2001, Appendices C & D) include excellent tabular listings of published research that between them account for 44 different research-based studies. Each of these three tables shows the breadth of conclusions that different researchers have reached concerning which factors are truly "critical" to success, although Crawford (who includes the Morris and Hough work in her own table, as well as all three studies described earlier) categorizes them into 24 groups of similar factors. Nevertheless, 24 is a very large number of "critical" factors, and if so many things are all equally important, it is also fair to conclude that nothing is especially important. What can the perplexed practitioner conclude from all this?

The first legitimate conclusion is that this is a genuinely difficult field of study that is bedevilled by at least three dimensions of difficulty. The first of these is the absence of generally accepted definitions for all the terms used to describe the subject, and it has already been noted what a "slippery" topic it is. Variations in language occur in different places: between researchers both as they frame the research questions and as they describe the results; between project managers and teams as they provide the data for analysis; between stakeholder groups with differing interests in the same project, and even between any given stakeholder group as its perceptions change over time; between organizations in their own internal project management guidance literature; and between industries and markets that each have their own distinct vocabulary (try talking to a research chemist in pharmaceutical R&D about "project scope management").

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But if that were not enough, it is still only a part of the story. A second dimension of difficulty is the multi-factorial variability of projects themselves, which makes comparisons between any two projects fraught with uncertainty. Projects are undertaken by unique temporary organizations, using unique combinations of resources (human and other) to undertake a unique, novel and temporary endeavour that is faced with unique inherent uncertainty in order to deliver unique beneficial objects of change (Turner and Müller, 2002). On top of this, it may be the case that projects, like the weather or stock markets, are subject to "sensitive dependence on initial conditions" (Richardson, Lissack, and Roos, 2000). The third dimension of difficulty is the problem of developing robust research methods that need to encompass three worlds as varied as the physical, the social and the personal, each of which plays an important part in the management of projects. Taken together, these three dimensions present a "call to action" to the project management research community that it needs to "raise its game" if it is to offer practical assistance to project management practitioners and the organizations that employ them.

The second conclusion is perhaps more helpful in terms of improving project management practice - there is no "silver bullet" with which instant success can be achieved. As in the majority of challenging human endeavours, achieving project success comes through a combination of factors and an organization can be sure that it understands them only when it begins to see improvements in its level of consistent project success.

The third conclusion is more helpful still. Although success can be achieved only through a combination of factors, there is a relatively high degree of agreement on the kind of factors that are critical to project success. It is these that the remainder of this section will address.

But first, there is a need to "map" the existing research onto the three levels of success that have been defined in this article. This can be done with the aid of the project manager's worldview analysis (Cooke-Davies, 2001) that was mentioned earlier, in the discussion of the criteria for project success. Figure 5 shows the relationship of the eleven groups of topics expressed as a systemigram.

Of these, an examination of the detailed concepts incorporated into each allows seven of the groups to be associated with criteria for project management success as follows:

2. Project goals - Establishing, specifying and achieving the projects goals.
3. Product or service - Defining, specifying, assuring, manufacturing and delivering the product or service.
4. Project Work - Identifying, structuring, planning, executing and controlling the work to be carried out.
5. Inherent Uncertainty - Managing the uncertainty that is inherent in the uniqueness of the project.
6. Life cycle stages - Practices relating to managing the stages that the project will need to pass through.
9. Resources - Allocating organizational resources to the project.

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11. Temporary team - Creating, leading and managing the temporary team that will initiate, plan, control, execute and close the project.

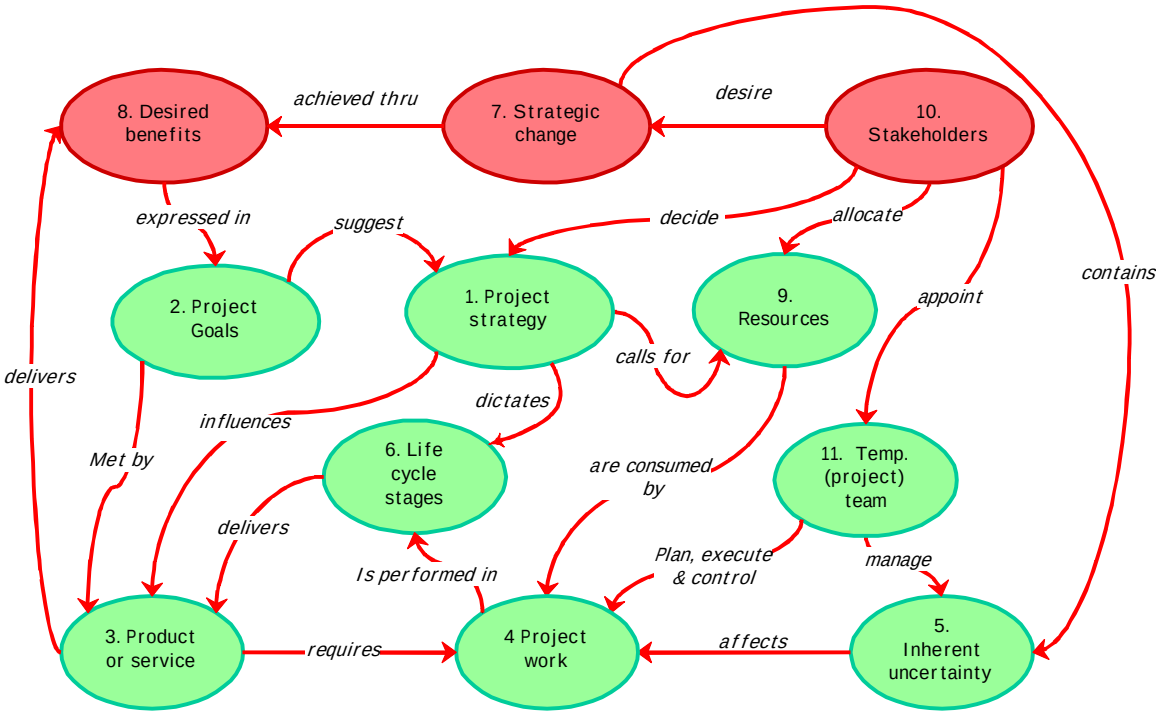

Figure 5: Elements of a project manager's worldview.

The remaining four (along with project goals, which acts as the hinge that links the two levels) can best be associated with project success as follows:

1. Project strategy - establishing a strategic framework for the project.
2. Project goals - Establishing, specifying and achieving the projects goals.
7. Strategic change - practices relating the project to the elements of business strategy to which it contributes.
8. Benefits - Defining, quantifying and harvesting organizational benefits as a result of carrying out the project.
10. Stakeholders - Identifying and aligning the interests of the project "stakeholders"

The detailed analysis underlying the worldview identified no groups of topics that could be associated directly with consistent project success, although individual topics that are contained at a lower level such as quality, culture and organizational learning clearly contribute to this third level.

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Project management success - how to ensure that the project is done right?

The criteria for project management success, as has been seen, may include cost, time, quality, scope, commercial performance, technical achievements or safety record. Although these can all be said to be indicators of project management success, the achievement of each of them is likely to depend on different factors, as one piece of recent research has indicated (Cooke-Davies, 2002a). In other words, if cost matters much more than time, then different factors are likely to be critical to the project team. Having said that, taking all the published research into account, six groups of factors can be identified as contributing to success at this level.

1 Achieve and maintain clarity about the goals of the project. Define the project in a way that clarifies both the goals of the project and the needs of stakeholders. Minimise changes to the goals once the project has started.

2 Select and assemble a capable project team of task-oriented individuals, led by a competent leader. Ensure that the team contains the right capabilities, is appropriately structured, communicates well, and has good processes for teamwork, problem solving and decision-making.

3 Ensure that the project is resourced adequately to the project scope and objectives. Mobilize top management support, and ensure that there is adequate support from the organization, and effective project administration.

4 Establish clarity at the outset about the technical performance required from the product, and manage the scope of work tightly, using a mature change management process.

5 Plan meticulously, using well-established estimating procedures, and to a sufficient level of detail to allow effective monitoring and control. Maintain excellent metrics that relate the technical content of work done to the elapsed time and expenditure incurred.

6 Employ established risk management practices that are well understood by all project participants, including effective risk response development and control.

A summary mapping the origin of these factors onto the seven relevant topic groups from the project managers' worldview is shown in table 1.

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Worldview	Lvl	Baker et. al.	Pinto & Slevin	Lechler	Crawford	Others
2. Project Goals	1	Goal commitment. Good cost estimates. Clear success criteria.	Project mission.	Goal changes.	Project definition	
3. Product or service	1				Technical performance.	Project scope management*
4. Project work.	1	Planning & control.	Schedule/plans. Monitoring & feedback.	Planning/ controlling.	Planning Monitoring and control	Performance management†
5. Inherent Uncertainty	1		Trouble-shooting.		Monitoring and controlling (risk)	Project risk management‡
6. Life cycle stages	1	Few start-up problems.				
9. Resources	1	Adequate funding. *	Top mgmt support. * Technical tasks.	Top mgmt.	Organizational support Administration	
11. Temporary team	1	Adequate capability. Task orientation. On-site project mgr.	Personnel.	Project leader. Project team. Participation.	Team selection. Communication. Leadership. Team development. Organization structure. Task orientation. Decision-making and problem solving.	

*[Cooke-Davies 2002]
†[Cooke-Davies 2002]
‡[Cooke-Davies 2002]

Table 1: Critical Factors for Project Management Success

Project success - how to ensure that the right project is done?

Before the "success" of any individual project can be measured, the benefits that it is intended to deliver must be considered, and these can vary considerably as the following partial list of project types indicates.

- Successful business process reengineering projects (which have a notoriously low rate of achievement of their objectives) can lead directly to improved competitiveness.
- If the organization is essentially project-based (as is the case in many of the traditional project management environments such as Engineering, Defence, Petrochemical exploration, Construction or IT/IS Systems Integration) then successful project performance translates directly into an improved bottom-line.
- If the organization is operations-based, then successful projects to support or to improve operations (such as marketing projects, plant shutdowns, or production engineering projects) lead indirectly to improved bottom-line performance.

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- Successful research projects and (in the case of some industries such as Pharmaceuticals) development projects lead to a maximised return on R&D spend, leading directly to the creation of new streams of operating revenue.
- Successful development projects improve time to market, and can enhance competitive position, product sales or product margins.
- Successful IT/IS projects deliver improved financial benefits (either directly or indirectly), and/or reduced wastage from aborted projects (Standish, 1995).
- Successful projects to design, procure and construct new capital assets can enhance time to market, return on investment, reduced operating costs or some combination of all three.

In spite of these complexities, recent work (e.g. Cooke-Davies 2002a) on benefits- and stakeholder-management supports the main body of literature in suggesting that there are in fact fewer factors that are critical. There are four of them, including the one that is also critical to project management success.

1 Achieve and maintain clarity about the goals of the project. Define the project in a way that clarifies both the goals of the project and the needs of stakeholders. Minimise changes to the goals once the project has started.

2 Establish and maintain active commitment to the success of the project and its mission on the part of all significant stakeholder groups, such as sponsors, clients, owners, operations management, parent company and so on. Establish effective communication and conflict resolution methods.

3 Develop and sustain effective processes during the project and after completion to deliver the anticipated benefits of the project and assure that they are realized. Ensure that a close link is developed and maintained between anticipated benefits, the business case for the project and the explicit project goals.

4 Develop a project strategy or "trajectory" in the words of Miller and Hobbs (2000) that is appropriate to the unique environment and circumstances of the project. ("Trajectory" is a term that encompasses both strategy and life-cycle model, and is derived from a detailed study of 60 mega-projects.)

A summary mapping the origin of these factors onto the seven relevant topic groups from the project managers' worldview is shown in table 2.

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Worldview	Lvl	Baker et. al.	Pinto & Slevin	Lechler	Crawford	Others
1. Project strategy	2					Project trajectory*
2. Project Goals	1	Goal commitment. Project mission. Good cost estimates. Clear success criteria.	Goal changes.	Project definition		
7. Strategic change	2		Project mission.		Strategic direction	
8. Benefits	2					Benefits realized† Business Case‡ Benefits delivery & management§
10. Stakeholders	2	No bureaucracy.	Client consultation.	Conflicts.	Stakeholder management	
			Client acceptance. Communication.	Information/ communication.		

*[Miller and Hobbs 2000]
†[KPMG][Thorp 1998]
‡[Beale 1991]
§[Cooke-Davies 2002]

Table 2: Critical Factors for Project Success

Consistent project success - how to ensure that the right projects are done right, time after time?

This third level of success has received little attention in the literature to date. The factors that are identified below are thus necessarily more speculative than those for either of the other levels. These three have been identified from a variety of elements of the author's own continuous action research described elsewhere (Cooke-Davies, 2001, 2002b, Egberding and Cooke-Davies, 2002).

1 An effective means of "learning from experience" on projects, that combines explicit knowledge with tacit knowledge in a way that encourages people to learn and to embed that learning into continuous improvement of project management processes and practices. Indeed, in a number of recent project management maturity models (e.g. Kerzner, 2001; Fahrenkrog et. al, 2003), continuous improvement represents the fifth and highest stage of project management maturity in an organization.

2 Portfolio and program management processes that allow the enterprise to resource fully a suite of projects that are thoughtfully and dynamically matched to the corporate strategy and business objectives. These processes include the dynamic allocation of scarce resources to competing projects, in a way that serves the enterprise as a whole.

3 A suite of project, program and portfolio metrics that provides direct "line of sight" feedback on current project performance, and anticipated future success, so that project, portfolio and corporate decisions can be aligned. Since corporations are increasingly recognizing the need

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for "upstream" measures of "downstream" financial success through the adoption of reporting against such devices as the "balanced scorecard" (Kaplan and Norton, 1996), it is essential for a similar set of metrics to be developed for project performance in those areas where a proven link exists between project success and corporate success. (See the chapter by Brandon.) For the project management community, it is also important to make the distinction between project success (which cannot be measured until after the project is completed) and project performance (which can be measured during the life of the project). No system of project metrics is complete without both sets of measures (performance and success) and a means of linking them so as to assess the accuracy with which performance predicts success.

Conclusion

Success "Level"	Typical criteria for success at this level.	Possible factors critical for success at this level	Organizational level accountable.
Level 1: Project management success. "Was the project done right?"	Time Cost Quality Technical performance Scope Safety	1 Clear project goals. 2 Well-selected, capable and effective project team. 3 Adequate resourcing. 4 Clarity about technical performance requirement. 5 Effective planning and control. 6 Good risk management.	Project manager. Project team
Level 2 Project success. "Was the right project done?"	Benefits realized. Stakeholder satisfaction.	1. Clear project goals. 2. Stakeholder commitment and attitude. 3. Effective benefits management and realization processes. 4. Appropriate project strategy.	Project sponsor. "Client", "owner" or "operator" (recipient of benefits)
Level 3 Consistent project success. "Are the right projects done right, time after time?"	Overall success of all projects undertaken. Overall level of project management success. Productivity of key corporate resources. Effectiveness in implementing business strategy.	1. Continuous improvement of business, project and support processes. 2. Efficient and effective portfolio, programme and resource management processes. 3. Comprehensive and focused suite of metrics covering all three levels.	Shareholders (or equivalent) Top managers. Directors of project management. Business unit managers. Portfolio managers.

Table 3: The elements of project success.

Table 3 summarises the points made in this chapter in tabular form. The table indicates clearly the different organizational levels that are involved in the assessment of project success, and shows how each of the three levels is necessary but, on its own, not sufficient for any organization that is serious about achieving project success consistently. The table as a whole represents a framework for thinking and talking about project success - a framework such as is necessary to underpin any attempts to advance the art and science of project management.

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