The Causes of Project Failure

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Abstract—**A study was conducted of 97 projects identified as failures by the projects' managers or parent organizations. Using the project implementation profile [20], a set of managerially controllable factors were identified as associated with project failure. The factors differed according to three contingency variables: 1) the precise way in which failure was defined; 2) the type of project; and 3) the stage of the project in its life cycle. Implications for project management and for future research on failed projects were noted.**

Introduction

THE attempt to gain a more complete understanding of the causes of project failure has been a difficult task for both academic researchers and practitioners. First, the concept of project failure is nebulous. Few people agree on exactly how to define project failure. The project management literature has a variety of definitions and distinctive examples of project failure, suggesting a basic lack of consensus and/or parsimony with regard to the topic. A second difficulty is that much of the research on project failure has been conceptually or anecdotally-based. While this approach is not necessarily bad, few attempts have been made to employ empirical methods in a more systematic study of the causes of project failure. As a result, many practitioners regard the causes of success or failure of their projects to be highly idiosyncratic and not generalizable to a larger project population [12].

A third difficulty is raised by the possibility that the causes of failure may vary by the type of project being studied. Distinctive patterns of causes may be associated with the failure of specific types of projects. Research projects might be affected by different factors than, say, construction projects. Fourth, the causes of project failure may also be contingent on the stage of the life cycle in which the project resides. The reasons a project might be viewed as a failure early in its life may be quite different than those seen to cause failure at some later point, during implementation for example.

It is important for project managers and researchers to gain a better understanding of the causes of project failure. With the well-recognized move toward an increased use of project organizational structures and project-based work techniques, there is a concomitant increased potential for misapplication and failure. Some years ago, a noted expert on project management wrote, "The many instances where project management fails overshadow the stories of successful projects [2]." While there is little reason to adopt such a pessimistic view today, if we can gain knowledge about the nature and causes of project failure, we will improve our ability to implement projects.

The primary purpose of this paper is to report the results of a recent study that was performed to determine if there exist patterns of causes of project failure depending on three contingency variables, 1) the way in which failure is defined, 2) the type of project being studied; and 3) the stage of the project's life cycle at the time it is assessed.

Theoretical Background

The search for factors that influence project success or failure has been of great interest to both researchers and practitioners. Several lines of research exist in a growing body of literature dealing with the subject, all of it an attempt to develop methods to aid project managers to evaluate their projects, if not objectively, at least systematically [8]. One stream of work is focused on developing decision rules and/or decision support systems to aid in making systematic decisions about which, if any, projects should be terminated [5]–[7], [17], [19], [22]. A second stream focuses on the development of a set of indicators or identifiable conditions so that problems with a project can be identified and addressed before it has failed [2], [21].

A third stream of research, an extension of the second but far more developed, suggests that project success is associated with the existence of several critical implementation factors (e.g., clear project mission, detailed project schedules, sufficient resources, etc.) [4], [14], [16]. In addition, recent research has demonstrated that the relative importance of these factors are often contingent on specific project characteristics, such as the type of project and its stage in the project life cycle [12], [13].

As noted above, little analytic work has been devoted to defining project failure. The phrase usually refers to a project that is terminated prior to completion. There may, however, be many reasons to cease work on an uncompleted project. Legal, social, political, technological, and/or economic environments may change in ways to obviate the project. Some external emergency may force the withdrawal of funds from the project. In such cases it seems inappropriate to say the project failed. If, however, we are able to suggest some basic dimensions to use in assessing project success or failure, project managers will be in a better position to determine the likelihood of implementation success (and, perhaps, to act so

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as to improve it) at an early stage in the process—before the marketplace has extracted its full penalty for failure.

Because the concepts of project failure, critical success factors, project life cycle, and project type are central to our model, each of these concepts will be briefly discussed.

Project Failure

Even though it is difficult to define exactly what constitutes a failed project, in examining a variety of failed projects, there appear to be some common aspects that suggest certain characteristics are strongly related to perceived project failure.

Based on an examination of the literature and interviews with experienced project managers, three distinct aspects of project performance (outcome) were identified as benchmarks against which to assess the success or failure of a project [10], [15]. These aspects are: 1) the implementation process itself; 2) the perceived value of the project; and 3) client satisfaction with the delivered project. The first of these aspects is primarily concerned with the internal efficiency of the project implementation process. The second and third aspects of project performance are concerned with the project's external effectiveness.

The success or failure of the implementation process itself is an internally-oriented measure of the performance of the project team, including such criteria as staying on schedule, on budget, meeting the technical goals of the project, and maintaining smooth working relationships within the team and parent organization. The key issue for the implementation process is efficiency.

The second aspect of the assessment of project success or failure is the perceived quality of the project and includes the project team's perceptions of the value and usefulness of the project's deliverables. This assessment places emphasis on the project's potential impact on users. This is the project team's judgment about how good a job they did for the client.

The project team's assessment of the project may or may not agree with the client's assessment. Client satisfaction, the third aspect of project performance, is an external measure of effectiveness, made by the client.

Note that all three of the performance measures are biased; that the underlying criteria on which they are based almost certainly contain conflicting elements (and probably will not be consistent across time); and that the precedence among the measures will shift as the team, parent firm, and client respond to internal or external pressures. Also note that this welter of confusion and uncertainty reflects the reality in which assessment of project performance exists. Since it seems likely that the causes of project failure may be different for each of the above ways of defining project failure, a hypothesis is suggested:

H1: The perceived causes of project failure will vary, depending on which outcome measure is used to assess performance.

Critical Success Factors

This research uses a framework developed by Pinto and Slevin [14]. Based on a survey of the literature and interviews with project and program managers, they identified ten general factors that they found to be critical to the successful implementation of a project. These critical success factors were found to be generalizable to a wide variety of project types and organizations. These factors served as the base for a measurement instrument, the Project Implementation Profile (PIP) [20] that allows an assessment of an organization's ability to carry a project through to full implementation. Table I lists and briefly defines the ten factors.

TABLE I
CRITICAL FACTOR DEFINITIONS

1) Project Mission—Initial clearly defined goals and general directions.
2) Top Management Support—Willingness of top management to provide the necessary resources and authority/power for project success.
3) Project Schedule/Plan—A detailed specification of the individual action steps 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 project to its ultimate intended users.
8) Monitoring and Feedback—Timely provision of comprehensive control information at each stage in the implementation process.
9) Communication—The provision of an appropriate network and necessary data to all key actors in the project implementation.
10) Trouble-shooting—Ability to handle unexpected crises and deviations from plan.
Source: [14].

As can be seen, each of the ten factors is related to issues over which the project team and/or its parent organization can exert some measure of control. The strength or mere presence of these factors is assumed to account for a significant part of the variance in project implementation success. A logical extension upon which the current research is predicated is to determine the effect of the lack of strength or absence of these critical factors on subsequent project failure. It should be stressed that we are aware of the role of environmental factors in determining project success or failure. Here, however, we are concentrating on the factors under some control by the organization implementing the project.

The Project Life Cycle: Strategy and Tactics

Life cycle models have been used in organizational research for many years to explain a wide range of organizational phenomena, and the life cycle concept has been applied to the project management process in a variety of settings, e.g., [13], [23]. The life cycle research suggests that the prepotency of a wide range of behaviorial issues, for example propensity toward conflict, changes at different points in the project development process, i.e., across its life cycle. It seems reasonable, therefore, to expect that the causes of project failure might differ, depending on the stage in its life cycle the project occupies.

For this study, a simplified two-stage project life cycle was employed. A simple method for distinguishing among the various stages from beginning to end of the project is through the concepts of strategy and tactics [18]. Strategy relates to the up-front planning activities when a project is being developed. Included are such elements as client's need identification, devising project specifications, and the development of budgets and schedules. Tactics, on the other hand, involve project execution, performance checks, and transfer of the project to its intended users.

H2: The perceived causes of project failure will vary, depending on whether the project is in the strategic or tactical stage of its life cycle.

Project Type: Construction Versus R&D

A final contingency variable to be considered in determining the causes of project failure is type of project. Recent research has shown that different types of projects conducted in different industries can have entirely different sets of factors associated with success [3], [12]. Two types of projects which apparently lie at opposite ends of the spectrum are those of construction and R&D. Several parameters can be used to distinguish among these types of projects, including level of uncertainty, utility of comprehensive project scheduling, and the precision with which outcome specification can be defined. As a result, the factors that cause a construction project to be perceived as a failure may be quite different from those that contribute to R&D project failure.

H3: The perceived causes of project failure will vary depending upon the type of project assessed: construction or R&D.

The Study

Sample

Questionnaires were mailed to 130 potential respondents, most of whom were members of the Project Management Institute (PMI), a national organization of project managers. Ninety-seven usable questionnaires were returned for a response rate of approximately 75%. T-tests of the mean responses on each of the research variables for early versus late respondents indicate no response bias.

The distribution of projects in the sample: 53 research and development projects (including hardware, equipment or appliance development, food, drug, or soft goods development, and new or improved computer software development), 29 construction projects, four service or test projects, five feasibility studies, and six miscellaneous projects.

Measurement Instrument

The project implementation profile (PIP) [20] mentioned above was used to identify the critical factors associated with project failure. The PIP was developed as a research/diagnostic instrument to enable project managers to assess the status of their projects through answering a series of questions related to the ten project implementation critical success factors identified by Pinto and Slevin [14]. In this research, the PIP required participants to use a 5-point Likert scale to indicate the degree to which a series of statements covering the ten critical factors were reflective of the actual state of affairs affecting a specific failed project.

The instrument's measure of project success/failure is an aggregate of 13 items (see Appendix). These items assess success/failure on a variety of criteria, including adherence to budget and schedule (issues of project implementation), perceived quality and utility of the final project, and client satisfaction with and probability of making use of the final project. The full instrument, then, was composed of the PIP and the 13 items used to derive a measure of project failure on each of the three bases noted above.

TABLE III
Project Failure Measure Factor Matrix

Item	Client Satisfaction Factor 1	Perceived Quality Factor 2	Implementation Process Factor 3
4—The project "works"	0.71		
5—The project will be used	0.86		
6—The project will benefit it's users	0.61	0.50	
8—Important clients will use the project	0.82		
10—Start-up problems will be minimal	0.75		
7—This project solves the problems for which it was created	0.41	0.55	
11—This project will lead to improved performance		0.84	
12—This project will have a positive impact		0.76	
13—This project is a definite improvement		0.79	
2—The project is on schedule			0.84
3—The project is on budget			0.76
9—Satisfaction with the development process			0.74
Eigen Value	4.89	2.07	1.09
% Variance Explained	40.7%	17.2%	9.0%
Total Variance Explained =	66.9%		

Procedure and Analysis

The questionnaire asked participants to select an ongoing or recently completed project that they would classify as a failure. Respondents were given considerable latitude in choosing their own criteria to use for the failure classification. The only benchmark offered in the questionnaire was the statement, "Knowing what we know now, would we have funded and developed this project? If the answer is no, it is likely that this project is or has been perceived, to some degree, as a failure." The project selected by the respondent then served as the frame of reference while completing the questionnaire. A brief description of the two stages of the project life cycle (strategy—tactics) was provided in the questionnaire, and respondents were asked to identify the stage of development of the selected project.

Results

Table II gives the means and standard deviations for each of the independent and dependent variables; the three project success/failure measures, an overall success/failure measure generated by aggregating the three partial measures, and the ten critical factor measures generated by the PIP—making 14 variables in all.

Table II also shows the Pearson product-moment correlation matrix. The psychometric properties of the instrument

TABLE II
MEANS, STANDARD DEVIATIONS, AND PEARSON CORRELATION MATRIX FOR RESEARCH VARIABLES*

Research Variable	Mean	Standard Deviation	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Project Success (Aggregate Measure)	3.07	.83														
2. Success 1 (Implementation process)	2.12	1.14	32*													
3. Success 2 (Perceived quality)	3.13	1.14	71*	24*												
4. Success 3 (Client satisfaction)	3.12	1.21	77*	04	61*											
5. Project Mission	2.45	1.51	16	13	25*	08										
6. Top Management Support	2.86	1.51	-08	02	-14	-09	33*									
7. Project Schedule	3.01	1.57	15	50*	09	-11	34*	21*								
8. Client Consultation	3.23	1.59	14	11	18	20*	11	-01	17							
9. Personnel	2.98	1.61	-13	35*	02	-29*	03	15	37*	-02						
10. Technical Tasks	2.93	1.58	23*	22*	23*	12	09	-21*	14	-05	37*					
11. Client Acceptance	3.13	1.78	18	01	17	31*	15	03	01	62*	-22*	-08				
12. Monitoring and Feedback	3.16	1.78	13	42*	14	-13	04	02	43*	25*	26*	24*	01			
13. Communication	3.25	1.44	11	23*	06	-01	12	16	37*	11	16	-01	01	63*		
14. Trouble-shooting	3.19	1.48	37*	40*	35*	16	15	-01	29*	09	23*	51*	03	56*	49*	

Scale items range from 1 (Strongly Disagree) to 5 (Strongly Agree)
N = 97 * $p < .05$, signif. is two-tailed

* Please note: The measures "Success 1, Success 2, and Success 3," were determined as a result of the factor analysis performed on the aggregate success measure (See Table 3). The complete set of success-measure variables are included in Appendix I. "Success 1 - The Implementation Process" is composed of variables 2, 3, and 9. "Success 2 - Perceived Quality" is composed of variables 7, 11, 12, and 13. "Success 3 - Client Satisfaction" is composed of variables 4, 5, 6, 8, and 10. The aggregate success measure contains variables 2 through 13.

were examined as a test of reliability. Cronbach alpha scores, used to assess measure reliabilities for the 10 critical factors and measure of project success/failure, ranged from 0.79 to 0.90, well above the acceptable level recommended by Nunnally [11].

Respondents were also asked to identify the project's current life cycle stage (Strategy or Tactics). Not surprisingly, the majority of respondents chose projects in the tactical stage. Because such projects are closer to completion, there tends to be less ambiguity about project success or failure. Of the total sample, 78 (80%) selected projects in the tactical stage, and 19 (20%) selected projects still in the strategic stage.

A confirmatory factor analysis, employing principal components analysis, was performed on the dependent measure of the PIP to determine if the three measures of success previously proposed (implementation process, perceived quality of the project, and client satisfaction) were, in fact, a valid subdimensional representation of the elements of perceived success or failure of a project. Table III gives the results of the factor analysis. The three expected dimensions did emerge with client satisfaction as the strongest factor, accounting for over 40% of the total variance in project success. Perceived quality was the second factor determined, accounting for 17.2% of variance. The implementation process factor also emerged with 9.0% of the variance. Total variance in project failure explained by the three factor solution was 66.9%. Item #1 of the 13 item set of project outcome measures (see Appendix) loaded weakly on each of the three dependent measures and so was dropped from subsequent analysis. The three distinct aspects of project failure uncovered by the factor analysis support the basis for our first hypothesis and suggest a degree of construct validity in the assessement of project failure [1].

Stepwise regression analyses were performed to test the hypotheses that causes of project failure would differ depending on the definition of failure employed, the type of project, and the project's stage in its life cycle.

TABLE IV
RESULTS OF MULTIPLE REGRESSION OF THE FACTORS ON PROJECT FAILURE BY PROJECT TYPE

	Construction Projects, $n = 29$	R&D Projects $n = 53$
Aggregate Fail	Tech. Tasks $\beta = 0.19$ $r^2 = 0.23$	Trouble-shooting $\beta = 0.24$ $r^2 = 0.14$ Personnel $\beta = -0.19$ $r^2 = 0.24$ (cum)
Implement Fail	Monitoring $\beta = 0.41$ $r^2 = 0.33$	Schedule $\beta = 0.33$ $r^2 = 0.26$ Trouble-shooting $\beta = 0.24$ $r^2 = 0.35$ (cum)
Quality Fail	Trouble-shooting $\beta = 0.24$ $r^2 = 0.29$ Tech. Tasks $\beta = 0.19$ $r^2 = 0.40$ (cum)	Mission $\beta = 0.23$ $r^2 = 0.11$ Trouble-shooting $\beta = 0.24$ $r^2 = 0.17$ (cum)
User Fail	Trouble-shooting $\beta = 0.26$ $r^2 = 0.20$	Personnel $\beta = -0.25$ $r^2 = 0.08$ Trouble-shooting $\beta = 0.37$ $r^2 = 0.14$ (cum) Monitoring $\beta = -0.31$ $r^2 = 0.23$ (cum)

$p < 0.05$.

TABLE V
RESULTS OF MULTIPLE REGRESSION OF THE FACTORS ON PROJECT FAILURE BY LIFE CYCLE STAGE

	Strategic Stage Projects, $n = 19$	Tactical Stage Projects, $n = 78$
Aggregate Fail		Trouble-shooting $\beta = 0.22$ $r^2 = 0.14$ Personnel $\beta = -0.16$ $r^2 = 0.19$ (cum) Tech. Tasks $\beta = 0.12$ $r^2 = 0.24$ (cum)
Implement Fail		Schedule $\beta = 0.35$ $r^2 = 0.32$ Trouble-shooting $\beta = 0.25$ $r^2 = 0.41$ (cum)
Quality Fail	Mission $\beta = 0.40$ $r^2 = 0.19$	Trouble-shooting $\beta = 0.29$ $r^2 = 0.14$
User Fail	Client Acceptance $\beta = 0.49$ $r^2 = 0.27$	Personnel $\beta = -0.31$ $r^2 = 0.09$ Tech. Tasks $\beta = 0.26$ $r^2 = 0.19$ (cum) Client Acceptance $\beta = 0.14$ $r^2 = 0.24$ (cum)

$p < 0.05$.

Table IV shows the results of the first analysis, examining causes of project failure by type of project (construction versus R&D).

Two factors appear to play predominant roles in determining failure for construction projects, lack of the technical expertise and support (technical tasks) and lack of adequate trouble-shooting mechanisms. Trouble-shooting inadequacies may be particularly damaging to project implementation when the project is evaluated through external effectiveness criteria such as perceived quality of the project and client satisfaction. As a result, hypothesis one showed strong evidence of support, suggesting that the perceived causes of project failure will vary, depending upon the performance criteria employed.

As Table IV also demonstrates, while there are similarities in the causes of project failure between construction and R&D projects, differences predominate, supporting the third hypothesis. As in the case of construction projects, inadequate trouble-shooting has a powerful impact on R&D project failure, no matter what measure of failure is employed. Also, for R&D projects, a wider variety of causes is associated with failure. For example, when internal efficiency (implementation process) is used to define failure, ineffective scheduling is strongly related to failure. When client satisfaction is the failure criterion, personnel and monitoring and feedback have strong predictive impact. When internal assessment of quality is used, the lack of a clear statement of project goals is associated with failure. The logic of the relationship between specific failure causes and each criterion is quite clear.

Table V relates the causes of project failure to life cycle stage, either Strategy or Tactics. The implementation criterion (internal efficiency) is tactical by nature, so it is not surprising that no causes of strategic project failure were associated with this criterion. Of the projects assessed as failures while still in their strategic stage, the relevant criteria for failure were those related to external effectiveness: perceived value of the project and client satisfaction. Apparently, many project managers question whether or not their project is potentially valuable to the intended user and/or to their own organization. If the answer is "No," the project tends to be seen as a failure early in its life cycle. As further support for this view, (and in a rare case of conceptual neatness) consider that the predictor of project failure is lack of a clear mission when success/failure is measured in terms of perceived value. In addition, when failure is judged in terms of client dissatisfaction, the client acceptance factor is a strong predictor of project failure.

A wider variety of critical factors impact on the perceived failure of projects that are currently in the tactical stage of development, suggesting support for our second hypothesis. While trouble-shooting is again found to be a significant predictor across a variety of project failure criteria, other issues such as lack of adequate personnel, ineffective scheduling, lack of client acceptance, and inadequate technical support are also differentially important predictors of tactical failure.

DISCUSSION

The concern with project failure and its causes stems from the same roots as concern with the problem of when and

TABLE VI
COMPARISON OF CRITICAL FACTORS ASSOCIATED WITH SUCCESS AND FAILURE, BY PROJECT LIFE CYCLE STAGE

	Strategic Stage	Tactical Stage
Success Factors	Mission Top Management Support Schedule/Plans	Client Consultation Personnel Technical Tasks Client Acceptance Monitoring & Feedback Communication Trouble-shooting
Failure Factors	Mission Client Acceptance	Trouble-shooting Personnel Technical Tasks Schedule/Plans Client Acceptance

Source: Success factors, see [16].
Failure factors, see Table 5.

under what circumstances should projects be terminated. As is true of much of the research on project management, work on the failure/termination decision problem began with attempts at generalization (e.g., [7]). Even when field studies and/or anecdotal evidence were used as a database, conclusions that were still generalized to all industries, stages of the project life cycle, and project types were the result (e.g., [9]). The emphasis on generalization includes such comparatively recent and elegant studies as [5], [17].

At the same time, many project managers and some researchers tacitly adopted the notion that project failures were unique occurrences and that the causes of failure were idiosyncratic to the firm, perhaps to the project. By necessity anecdotal, work with this orientation reported in detail on a specific project and allowed readers to adopt whatever conclusions seemed applicable.

Recent work by Baker *et al.* [3], Tadisina [22], and a few others pursued a middle ground. Having contributed to both extreme positions in the past, we sought to join them. Our results show that while projects have some fundamental similarities in terms of the factors that can determine their success or failure, there are some important contingency variables that force us to recognize that the causes of failure can and do differ in important ways among projects.

An important finding of this study was support for the idea that terms such as project success or failure must be assessed based on several criteria, not on one monolithic measure. Follow-up interviews with some of the respondents confirmed the idea that a project's success or failure is often in the eye of the beholder. What constitutes project failure for one organization may be viewed as success in another. If a firm is intent on implementing a project to fulfill a need expressed by an important, long-standing client, it would make little sense to judge the success or failure of that project solely in terms of internal efficiency measures such as adherence to budget and schedule. Of far greater importance would be perceived quality of the project and client satisfaction. This research clearly implies that the causes of project failure (viewed as the deficiency or lack of various critical factors) are strongly contingent on how the organization measures the success of that project, a finding that supports H_1.

Our findings also support hypotheses H_2 and H_3 regarding the contingency effects of project type (construction versus R&D) and life cycle stage (strategy versus tactics) on predictors of project failure. The factors that are predictive of project failure vary widely depending upon the type of project examined. This finding confirms recent work that demonstrated how critical success factors in project implementation differ dramatically across different lines of business or types of projects [3], [12]. Further, the factors that predict project failure during the early strategic phase of a project's life are quite different from those associated with failure at a later point during tactical operationalization. It is, incidentally, interesting to note that the factors associated with failure are not simply one-minus the success factors, though there are similarities in the lists (see Table VI).

A final important finding of this study lies in the identification of some specific critical factors that, if inadequately addressed, are strongly associated with project failure. This should be of practical benefit to project managers. For example, as Table IV shows, in R&D projects for which success is viewed as an issue of internal efficiency (implementation process), lack of detailed project scheduling and trouble-shooting mechanisms are both significant predictors of project failure. As a practical suggestion, for R&D project managers having the goal of maximizing internal efficiency, it is important to develop comprehensive scheduling procedures and maintain updated project trouble-shooting mechanisms. Indeed, if there is one generalization that applies almost uniformly, it concerns the importance of competent trouble-shooting for the project.

LIMITATIONS AND CONCLUSIONS

This study had some limitations that need to be addressed. One important limitation refers to the results of the stepwise regression analysis which demonstrated that the project implementation critical factors used in the study accounted only for about 40% of the variance in causes of project failure. There are certainly important causes of project failure that were not accounted for in this study, environmental factors, for instance. Clearly, changes in the project's environment, beyond the control of management, can also cause projects to fail. Unforeseen economic downturns, development of a superior technical alternative, or changes in governmental regulations are among the many reasons project might fail. Our focus has been on factors over which project or parent firm management exerts some control; for example, defining a clear mission or staffing the project with appropriate personnel. We feel that future research should examine the relative proportion of projects failing due to unforeseen circumstances versus those which fail due to management error.

A second limitation to this study lies in the use of a mail survey research methodology. It is possible that such a potentially sensitive topic as failed projects might cause a social desirability bias in responding to the questionnaire. This limitation was offset, in large part, by making initial contact with these managers and securing their cooperation and willingness to respond prior to sending out the survey. Through guaranteeing anonymity to respondents, a large percentage of those initially contacted did subsequently complete the questionnaire. Follow-up interviews with a sample of the respondents indicated they had no hesitation in expressing their perceptions about the causes of project failure.

Even with these limitations, this study has important implications for project management. The purpose of the study was to see if the causes of project failure were influenced by three contingency variables; 1) the way in which project failure was defined; 2) the type of project being implemented; and 3) the stage in the life cycle occupied by the project. The results demonstrated empirical justification for a multi-dimensional construct of project failure, encompassing both internal efficiency and external effectiveness aspects. The fact that the critical factors associated with failure depended on the way in which failure was defined suggests that we need to know considerably more about how project managers define failure (and success) and, indeed, how the parent organization makes judgments on the matter. In addition, this study suggests that future research into the causes of project failure must take into account a variety of contingency variables, such as type of project, and the project's stage in its life cycle. More important, the study suggests that managerial attention to some specific critical factors, dependent on these contingency variables, can lessen the likelihood of project failure.

Appendix

Scale Items Included in Project Performance Measure

Item 1: Knowing what you know now about the status of this project, we would have developed the project.

Item 2: This project has/will come in on schedule.

Item 3: This project has/will come in on budget.

Item 4: The project that has been developed works, (or if still being developed, looks as if it will work.

Item 5: The project will be/is used by its intended users.

Item 6: This project has/will directly benefit the intended users: either through increasing efficiency or employee effectiveness.

Item 7: Given the problem for which it was developed, this project seems to do the best job of solving that problem, i.e., it was the best choice among a set of alternatives.

Item 8: Important clients, directly affected by this project, will make use of it.

Item 9: I am/was satisfied with the process by which this project is being/was completed.

Item 10: We are confident that non-technical start-up problems will be minimal, because the project will be readily accepted by its intended users.

Item 11: Use of this project has/will directly lead to improved or more effective decision making or performance for the clients.

Item 12: This project will have a positive impact on those who make use of it.

Item 13: The results of this project represent a definite improvement over the way clients used to perform these activities.

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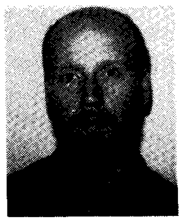

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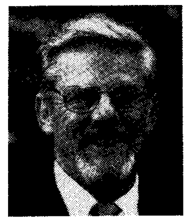

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