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Title:　　　The Keys to Success and the Pitfalls of Failure: Guidelines for Project Management

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Abstract: This paper attempts to answer the questions: Are there key management techniques that generally lead to project success? Are the management techniques that generally lead to project failure

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[handwritten annotations: Data Analysis as well as poor research design for ex. why use -3 --3 instead of 1 --5 likert Scale]

Table of Contents

Executive Summary

From the onset, some projects appear predestined for success while others are doomed for failure. Can key management techniques be identified that will lead to a successful project outcome? In addition, are there key management techniques that contribute to project failure? The following research paper attempts to answer these questions and provide recommendations on the project management activities that lead to success, as well as key factors that contribute to failure.

Introduction

The first item described is the methodology taken to gather data on project management. The details of the literature research and its limitations are discussed followed by the approach taken for the survey generation, distribution and analysis.

Project management techniques identified in prominent literature are noted and the key items to ensure project success or, to lead to failure are listed.

Next, the details of the survey are shown in graphical form and analyzed to derive a list of factors respondents felt contributed to the success or failure of a project.

The survey responses are compared to prominent literature and correlated into *keys to success and pitfalls for failure*.

The risks associated with the project are identified in conjunction with a list of potential future studies that would reduce the risks.

Finally, recommendations are summarized to provide guidelines to ensure project success.

Methodology

In order to collect data on the various parameters pertaining to project management a questionnaire was generated and distributed. The responses from the survey were then correlated and the results compared with prominent literature describing how to manage projects. A summary of recommendations on key techniques leading to a successful projects outcome was generated from the comparison of survey results in conjunction with the literature review.

Literature Research

Approach: A search for relevant literature was performed at Portland State University (PSU) Library, Multnomah County Library and via the Internet. The search focus topics of: project management, program management and new product introductions. Over 250 potentially applicable articles were identified.

Limitations: Of the over 250 articles identified only 24 were available at the PSU Library and time permitted review of only 30 articles on the Internet. Of the over 250 articles identified only twenty-four were determined to be applicable. Lack of time and applicable articles limited the breadth and scope of analysis.

Survey

Approach: A questionnaire was developed so that, with the use of statistical analysis techniques, a prediction could be made regarding practices in project management which lead to success or failure.[1] The respondents were asked to answer sixteen questions on at least one project that they had personally been involved with. The questions on the survey were ranked on a scale -3 to +3; -3 corresponded to "strongly disagree to the statement" and +3 corresponded to "strongly agree to the statement." Not only was the scale easy to understand by participants, but it was also conducive to data analysis. Once the questionnaires were returned, the responses were analyzed to identify project trends and correlation's.

Limitations: While the survey offered many interesting observations, the accuracy of the analysis was limited by the following:

⇒ Time
⇒ Sample size
⇒ Questionnaire bias
⇒ Consistency of responses

The time available to distribute and gather surveys was limited; due to time constraints only fifty-one questionnaires were returned by the deadline; only thirteen of the responses returned reflected projects which had failed. In addition, after the surveys were returned, it appeared that the scale was not understood in the same manner by all of the respondents. It was determined that lack of consistent interpretation could severely impact the reliability of analysis and further investigation was required. Of the eleven inquiries made seven respondents correctly understood the '0' point on the scale as a neutral point, three used it as "not really bad, not really good," and one respondent used it as "I don't know." These limitations in sample size and consistency made correlation difficult and potentially inaccurate results.

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[1] For a copy of the survey see Appendix A

Literature Research

Prominent literature consistently defines a project as a series of tasks and activities that have: a specific objective to be completed within certain specifications, defined start and end dates, funding limitations and resources requirements (i.e. money, people, equipment)[A]. The project management process can be defined as a set of principles, methods, and techniques for the effective planning and control [F].

Successful Projects

Successful projects are globally defined as having achieved the following objectives:

⇒ Meeting desired performance levels.
⇒ Meeting time constraints.
⇒ Meeting budget constraints.
⇒ Utilization of assigned resources effectively and efficiently.

Ten key factors that have been found to be crucial in the successful implementation of project development are [I], [C], [D]:

1) Project Mission
   ◊ Clearly defined goals and general directions initially.
2) Top Management support
   ◊ Willingness of top management to provide the necessary resources and authority for 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 involved 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 actions.
7) Client Acceptance
   ◊ The act of "selling" the final project to its ultimate intended users.
8) Monitoring and Feedback
   ◊ Timely provision of comprehensive information at each stage in the implementation process.
9) Communication
   ◊ The provision of an appropriate network to all key actors in the project implementation.
10) Trouble-shooting
   ◊ Ability to handle unexpected crises and deviations from plan.

(Literature Research Continued)

Project Failure

At the other end of the spectrum are projects that fail definitively. These projects share the following characteristics[B]:

⇒ Performance objectives are not met.
⇒ Time allocated for completion is exceeded.
⇒ Budget constraints are exceeded.
⇒ The results do not fulfill the expectations of the user or developer.

The primary reasons projects fail fall into the following ten categories [A]:

1) Goals
    ◊ Not clearly understood at lower levels of organization.
2) Plans
    ◊ Encompass too much in too little time.
3) Financial
    ◊ Estimates were poor.
4) Planning
    ◊ Based upon insufficient data and done by the planning group alone.
5) Objectives
    ◊ No one knew the ultimate objective.
6) Key milestones
    ◊ No one knows the major milestone dates.
7) Projects estimates
    ◊ Estimates are best guesses, not based on historical data.
8) Time
    ◊ Not enough time was given for proper estimating.
9) Resources
    ◊ No one bothered to see if personnel would be available with the necessary skills.
10)People
    ◊ Replacing people in the project.

(Literature Research Continued)

Literature Comparison of Successful Versus Unsuccessful Projects

The definitions of success and failure listed above represent extremes; it is possible to have varying levels of success or failure.[2] One study on project effectiveness based, on an examination of literature and interviews with experienced project managers, was conducted by Pinto and Mantel. Pinto and Mantel identified three distinct aspects of project performance as benchmarks to assess the level of success or failure. These aspects are: (1) The implementation process itself, (2) The perceived value of the project, (3) client satisfaction with the delivered project and (4) time-to-market [H].

Implementation: The success or failure of the implementation process itself is an internally-orientated 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.

Perceived value: 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 upon users. This is the project team's judgment about how well a client's job has been performed.

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

Completion time: Finally, in new product development, there exists another factor which can contribute to varying levels of success and failure. This factor is the time to market or fast development time [G].

Minimizing the Risk of Project Failure:

In order to reduce the risk of project failure an emphasis should be placed on selecting the best project manager, teamwork, goals, planning and implementation.

Selecting the best project manager: The best project manager is one who "loves his work [W]." Aside from his technical and managerial knowledge equally important are his leadership skills [U], [W]. Leadership is essential to any project. The degree of leadership ability depends on past experiences of the project manager. Managing employees without an understanding and appreciation for the task is not only difficult but potentially damaging to the project's success.

In addition to intimately understanding the tasks at hand, leadership requires a particular temperament. The manager needs to hold team members accountable, as well as motivate, coach, and inspire them. The manager should be forthright when problems occur. They must be able to compromise, seek innovative solutions and to anticipate problems before they reach criticality [U].

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[2] The Sydney Opera House is one well-known example that has portions of success and of failure. In 1959 the State Government of New South Wales, Australia, estimated that the Opera House would cost $A7 million. It was completed in 1973 at a total cost of $A100 million. The Opera House is a source of pride and accomplishment for Australians thus, the user's satisfaction goal was achieved, but the time and cost goals were not.

(Literature Research Continued)

Teamwork: In order to succeed a project must be staffed with the correct number of individuals having the right skills. When working with a less experienced staff, the project manager has to place additional emphasis on more elaborate control and reporting systems with detailed project work plans [U].

Cross-functional teams are necessary, mainly in the implementation phase of the project. At the same time, it is widely recognized that divergent interests and points of view are inevitable when individuals from multiple functional areas work together on projects due to their differing orientations toward goals, interpersonal relations, and key external constituents [J]. The potential lack of cooperation creates difficulties in reaching agreement on integrated programs of action and subsequent implementation of decisions [J]. Thus, to facilitate the project implementation process, it is often necessary to foster cross-functional cooperation at first [K]. Several researchers demonstrate the relationship between cross-functional cooperation and successful project implementation [L, M, N]. At present, companies are reinforcing the concept of team-building in their projects [O] [P].

Clearly defined goals and responsibilities: It is suggested there is a high correlation between goals clearly understood by all members of the project and the success of the project [J], [L], [M], [X]. Therefore it is necessary that the project objectives are well defined. However, under high uncertainty it is hard to identify the goals and objectives clearly. Sometimes change is necessary because objectives change during the project. The determination of what goals a project actually incorporates affects the fundamental definition and execution of project [X].

Planning: Planning in general can be described as the function of selecting the project objectives and establishing the politics, procedures, and programs necessary for achieving them. Planning in a project environment may be described as a predetermined course of action within a forecasted environment. Planning is determining what needs to be done by whom and when, in order to fulfill the objectives [A]. Proper planning gives a plan of attack and a method for feedback and control [D]. Project planning encompasses scheduling, budgeting/cost monitoring and risk assessment.

One of the key steps in process planning is scheduling. Progress on each task should be reviewed frequently. If necessary, project constraints should be adjusted through the use of a reporting or control system which can highlight potential problem areas [U]. The five major scheduling approaches used in project management are milestone charts, Gantt Charts, full wall scheduling, and the precedence network techniques -CPM and PERT. Although CPM and PERT charts are very popular, they have the problem that they do not visualize the interconnections between individual responsibilities and the responsibilities of the development organization as a whole [S]. Thus, it is important that people managing the schedule charts possess the skills and the knowledge of the technique itself [E]. Nowicki emphasizes the importance of involving all team members in the planning phase. Involving all team members ensures that the best possible data is used. The overall outcome shows that the project and its participants have the greatest chance of success. Nowicki also suggests if a task is likely to last longer than 20 days, it should be broken down into sub-tasks so that it can be better understood [Q].

(Literature Research Continued)

Another key step in process planning is budgeting and monitoring costs. The ability to prepare an accurate estimate depends upon the information available. As a project develops, the amount of information grows steadily until the final truth, the actual cost, is known at the end. A good budget depends on a good estimation of the duration of activities and experience. Thus, it is important to have the right people, with the correct expertise, in the project team [U]. The team should be 100% dedicated to the efforts [Q]. Project cost monitoring is the control exercised by the project manager and others, using information provided by the cost control function [V]. When an appraisal of the project indicates a cost or time overrun, there is time left to intervene. It is even possible to abandon the project if the project is no longer profitable because increased cost or losses in time [V].

Risk is the likelihood of an undesired event occurring within a specified period or in specified circumstances [E]. This definition highlights the relationship between project management and risk; the undesired event can occur and, if contingency plans are not in place, lead to disaster. Risk in projects is inevitable, and one of the greatest source of risk is making an accurate forecast of the cost and time for to completion [E]. However, if the origin of the risk is identified early, it can become part of the project and incorporated into the planning process [F]. In a perfect world, projects would be completed on time with the planned budget and resources. In the real world 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 government regulations are among the many reasons projects might fail [H].

Implementation: More projects fail due to improper implementation than any other reason [T]. One reason for failure is that many companies separate the formulation of a new product from that of product development. Thus, the person designing or manufacturing the product does not have the same "zeal" for its success as the originator [T].

Survey Data Analysis

With only thirteen survey responses identified as project failures the results of the analysis were not statistically significant. Although precise correlation's could not be precisely determined, it was possible to notice trends within projects. These trends indicated several key factors which lead to success and to failure.

Survey Results for Successful Projects

Successful Projects
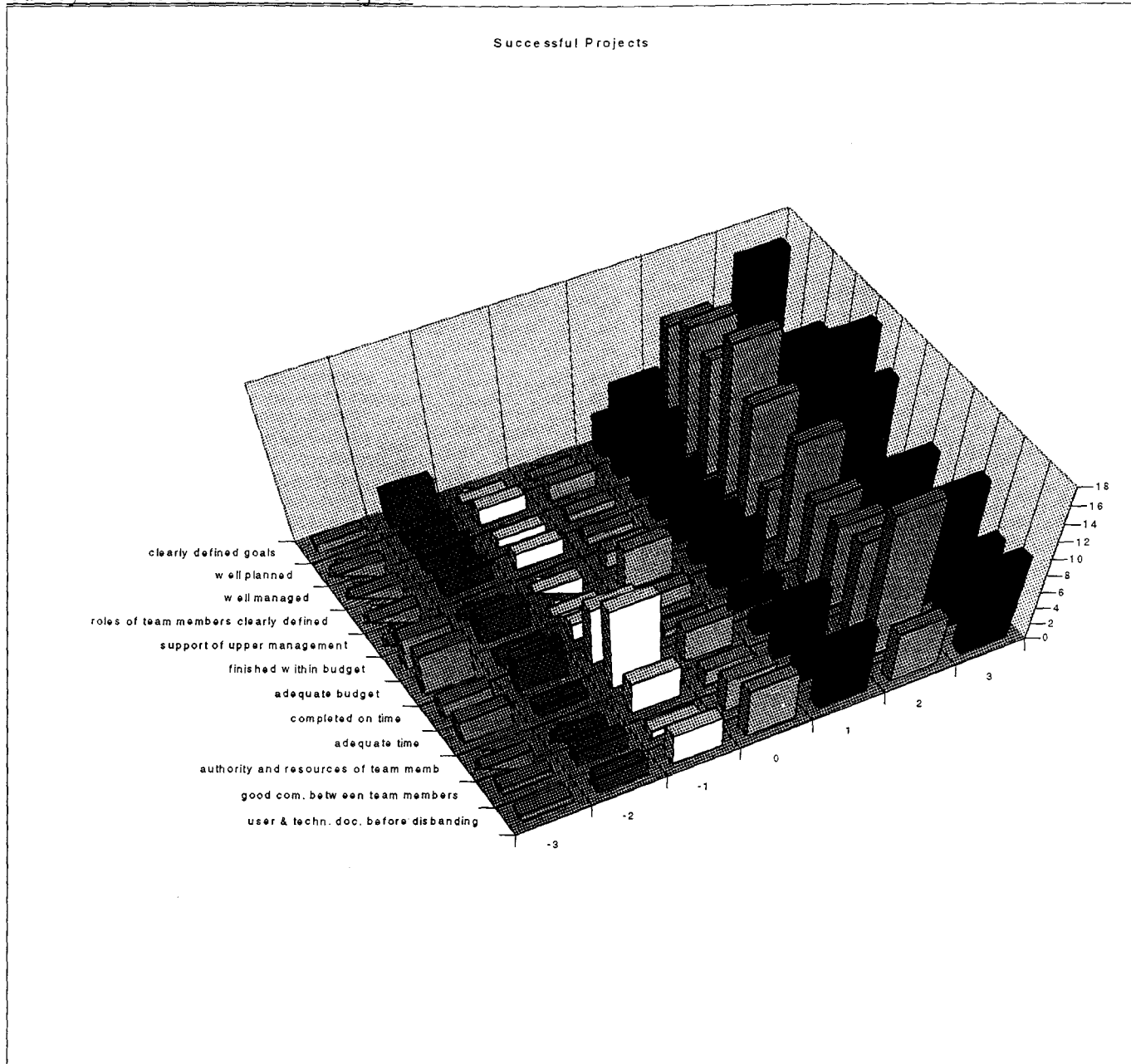
(Survey Data Analysis Continued)

Successful Projects

The indicators of successful projects are shown in Figure 2.[1]

The most prevalent indicators of successful projects are:

⇒ Clearly defined goals (86%).
⇒ Well planned projects (84%).
⇒ Well managed projects (89%).
⇒ The roles of the teams were clearly defined (86%).
⇒ Good support from upper management (95%).
⇒ The teams had adequate authority and resources (84%).
⇒ The projects finished within budget (67%).
⇒ The project had adequate budget (73%).
⇒ Good communication between the team members (78%).
⇒ The projects were completed on time (62%).
⇒ Adequate time allocated for the project (51%).

User and technical documentation adequately completed before disbanding (65%).
Figure 1 demonstrates the trend for successful projects as increasing, almost linearly, from the -3, "strongly disagree", to +3, "strongly agree."   This trend indicates respondents as a whole felt that if a project was well managed by a manager who had responsibility as well as authority, was supported by upper management, had clearly defined team roles/goals, good team communication, adequate budget and adequate time allocated, the project would be successful.
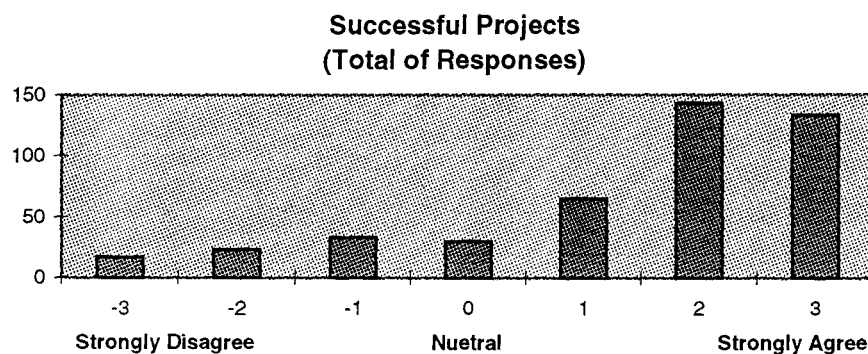
**Successful Projects
(Total of Responses)**

Figure 1.

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[1] The pie charts shown in figure 2 dipict how respondents who stated they had worked on a successful project answer the survey. The yellow portion of the pie chart represents greater then "0" or, a tendency to agree to the statement. The Blue portion of the pie chart represents a response less then "0" or a tendency to disagree and the Burgandy portion of the chart is the number of "0" or, nuetral responses. Thus, the larger the yellow portion of the pie the greater the indicator of a successful project.

(Survey Data Analysis Continued)
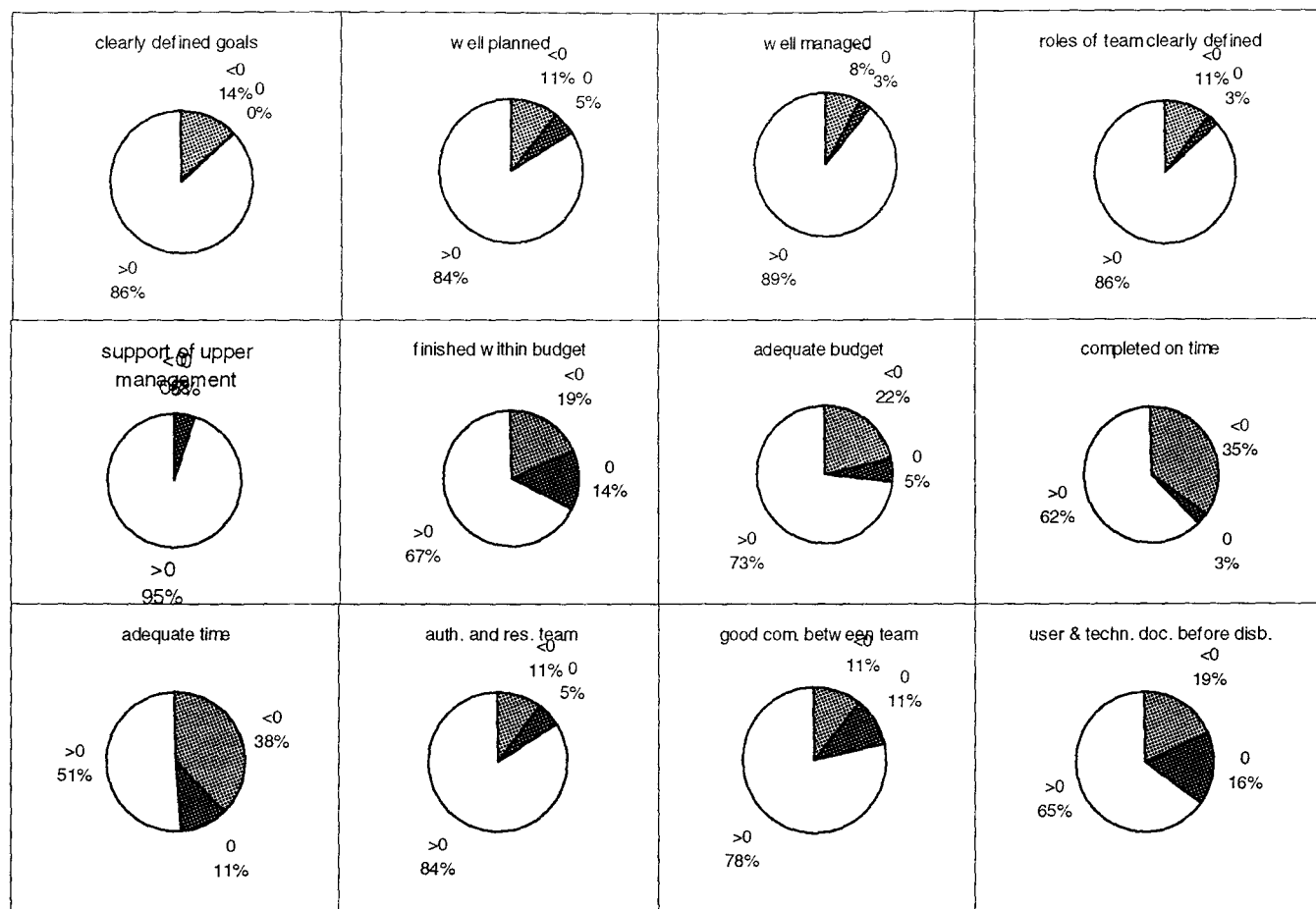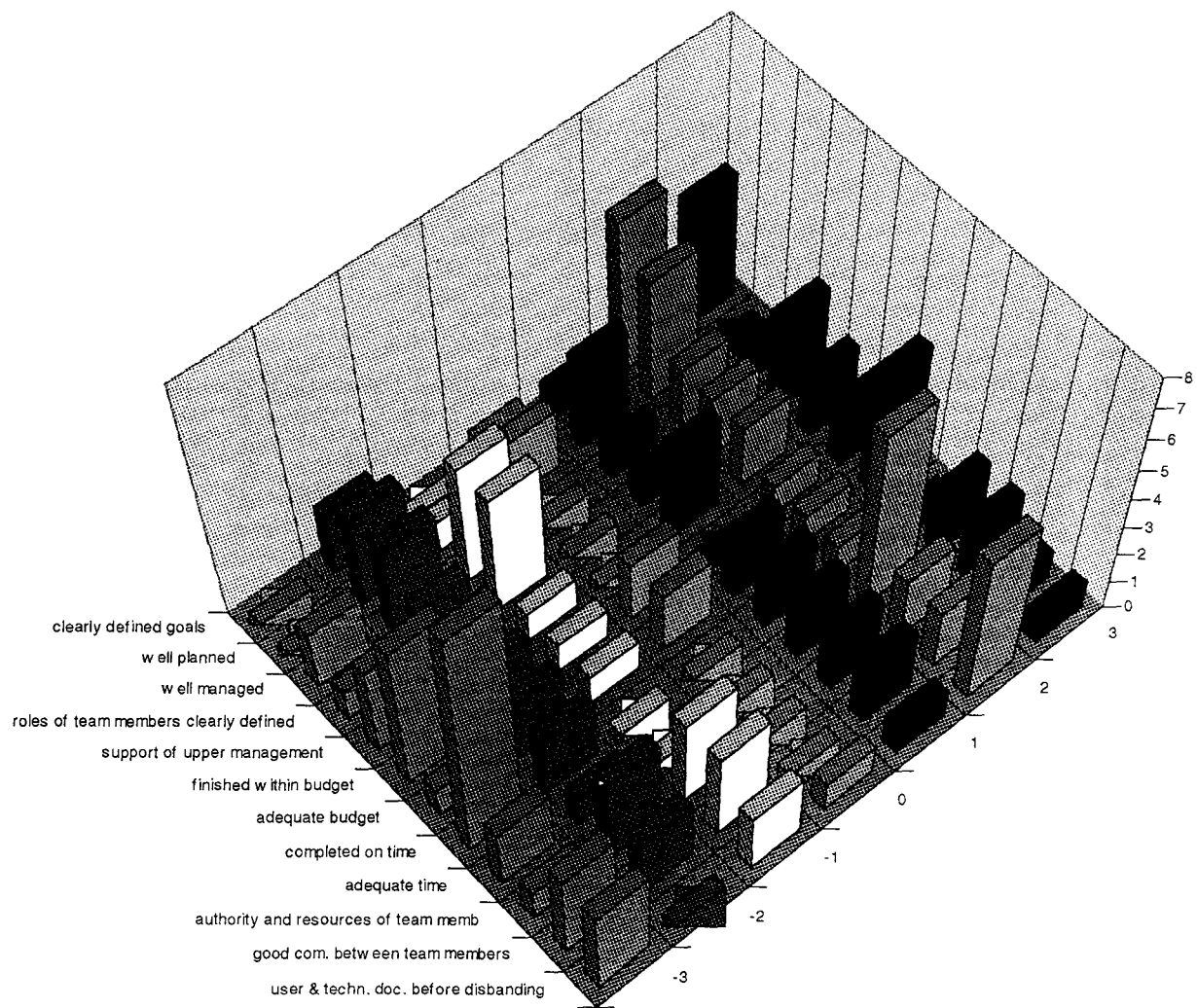
Indicators of Successful Projects

Figure 1.

(Survey Data Analysis Continued)

Survey Results for Unsuccessful Projects

Failure Projects

clearly defined goals
w ell planned
w ell managed
roles of team members clearly defined
support of upper management
finished w ithin budget
adequate budget
completed on time
adequate time
authority and resources of team memb
good com. betw een team members
user & techn. doc. before disbanding

8
7
6
5
4
3
2
1
0

3
2
1
0
-1
-2
-3

(Survey Data Analysis Continued)

Project Failure

The key indicators of why projects failed are shown in Figure 4.[2]

⇒ Inability to finish the project on time (77%), even with adequate time allocated to completing the project (77%).
⇒ Poor management of the project (69%).
⇒ Poor team communication (62%).
⇒ Inability to finish the project within budget constraints (62%) even with an adequate budget allocated (54%).
⇒ Lack of clearly defined team roles (54%).
⇒ Lack of authority and responsibility delegated to the project manager (54%).
⇒ Lack of support by upper management (46%).

An interesting note is the lack of consistency with the summary of total responses for failed projects as shown in Figure 3. One explanation for this inconsistency is that respondents as a whole felt that the project could have clearly defined goals and be planned well, but could fail due to one or two key elements such as poor management or poor team communication.
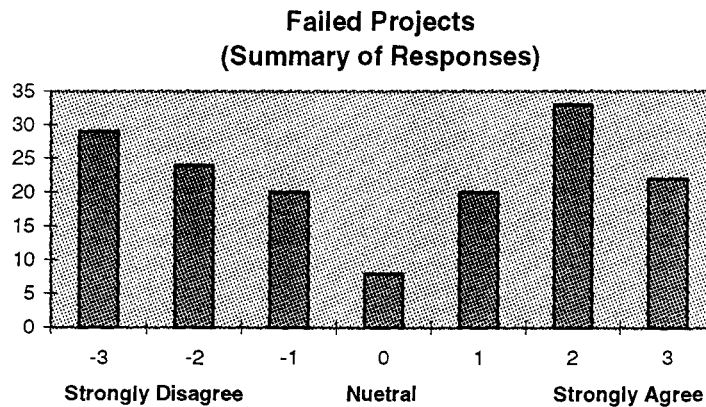
**Failed Projects
(Summary of Responses)**

Figure 3.

---

[2] The pie charts shown in figure 4 dipict how respondents who stated they had worked on a unsuccessful project answer the survey. The yellow portion of the pie chart represents greater then "0" or, a tendency to agree to the statement. The Blue portion of the pie chart represents a response less then "0" or a tendency to disagree and the Burgandy portion of the chart is the number of "0" or, neutral responses. Thus, the larger the blur portion of the pie the greater the indicator of an unsuccessful project.

(Survey Data Analysis Continued)

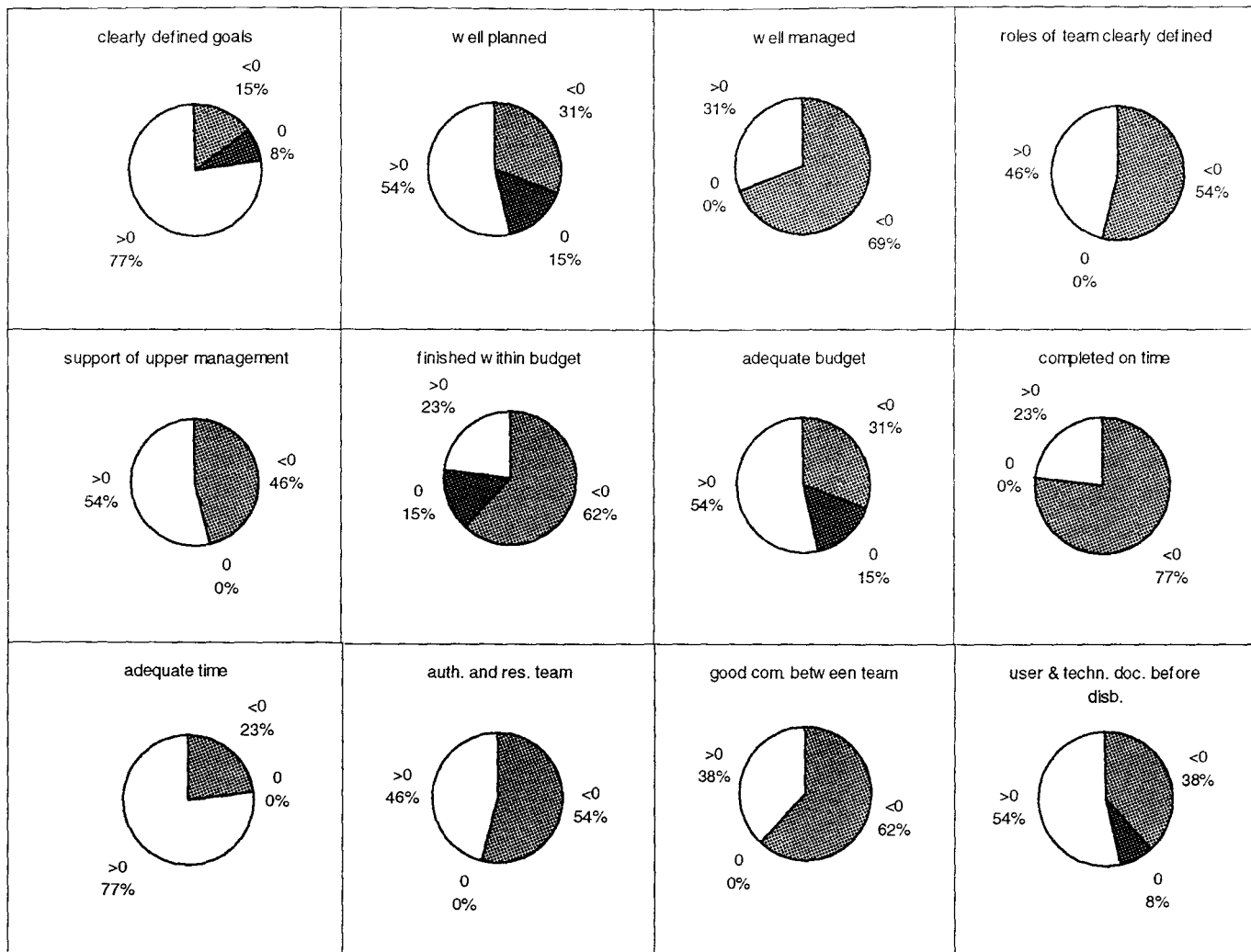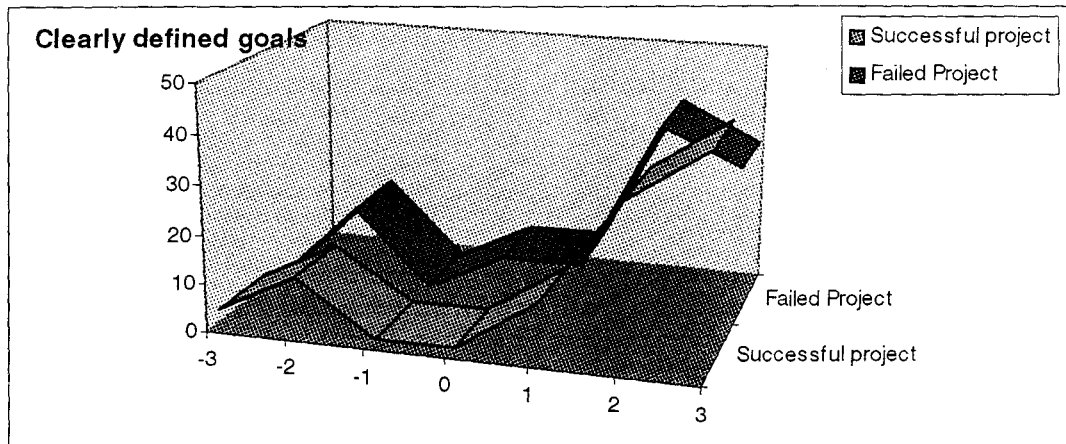## Indicators of Unsuccessful Projects

clearly defined goals
<0
15%
0
8%
>0
77%

well planned
<0
31%
>0
54%
0
15%

well managed
>0
31%
0
0%
<0
69%

roles of team clearly defined
>0
46%
<0
54%
0
0%

support of upper management
>0
54%
<0
46%
0
0%

finished within budget
>0
23%
0
15%
<0
62%

adequate budget
<0
31%
>0
54%
0
15%

completed on time
>0
23%
0
0%
<0
77%

adequate time
<0
23%
0
0%
>0
77%

auth. and res. team
>0
46%
<0
54%
0
0%

good com. between team
>0
38%
<0
62%
0
0%

user & techn. doc. before disb.
<0
38%
>0
54%
0
8%

Figure 4.

14

(Survey Data Analysis Continued)

<u>Comparison of Successful Versus Unsuccessful Projects</u>

The project had clearly defined goals:

> On a scale from - 3, "strongly disagree," to + 3, "strongly agree," both successful and unsuccessful projects follow a similar curve. Although successful projects show more clearly defined goals, clearly defined goals do not automatically lead a project to success. Thus, the analysis indicates that **clearly defined goals are not a determinant factor in project success or failure.**

*The project was well planned:*

> Whereas both successful and unsuccessful projects may display good planning, the graph indicates that poor planning is a cause of project failure. The conclusion drawn is that a **poorly planned project may be a cause of failure and a project will not be successful if not well planned.**
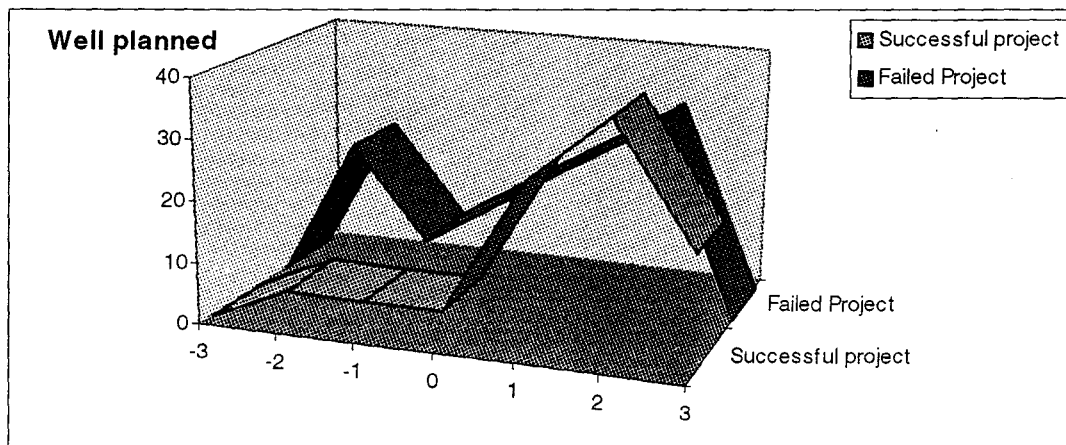
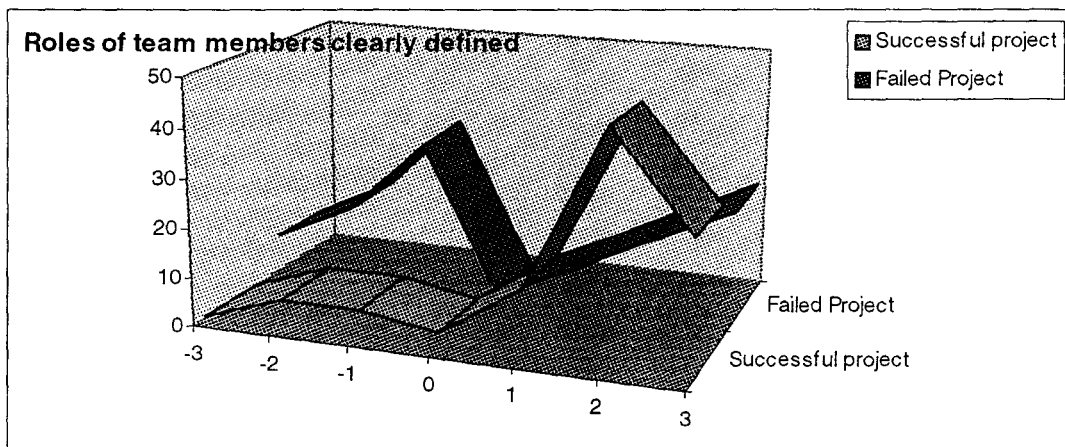## (Survey Data Analysis Continued)

The project was well managed:

The following graph indicates that the degree of proper management is directly proportional to project success and inversely proportional to project failure. Thus, the conclusion drawn from data analysis is that a **successful project is well managed, whereas an unsuccessful project typically is not.**
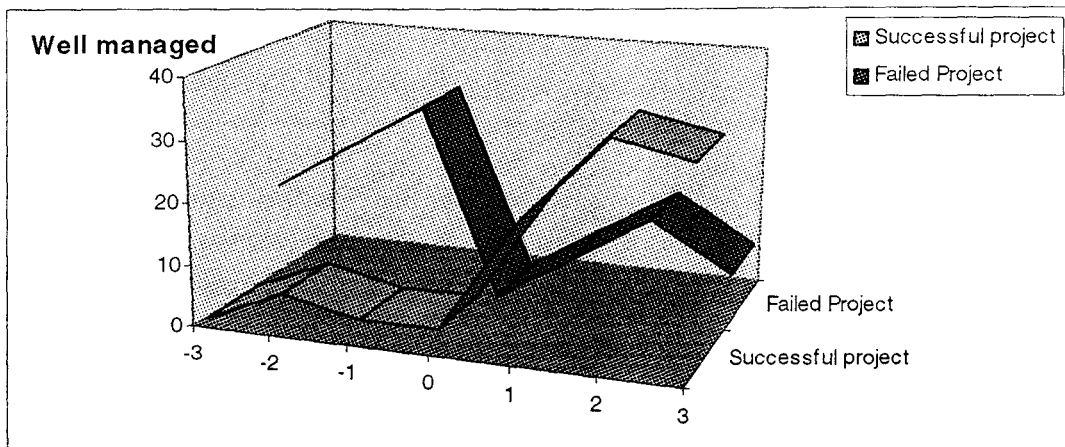
*The roles of team members were clearly defined:*

The following graph indicates that for successful projects it may be difficult to evaluate the effect of clearly defined roles however, it does indicate that **lack of clearly defined team member roles is a primary cause of project failure.**
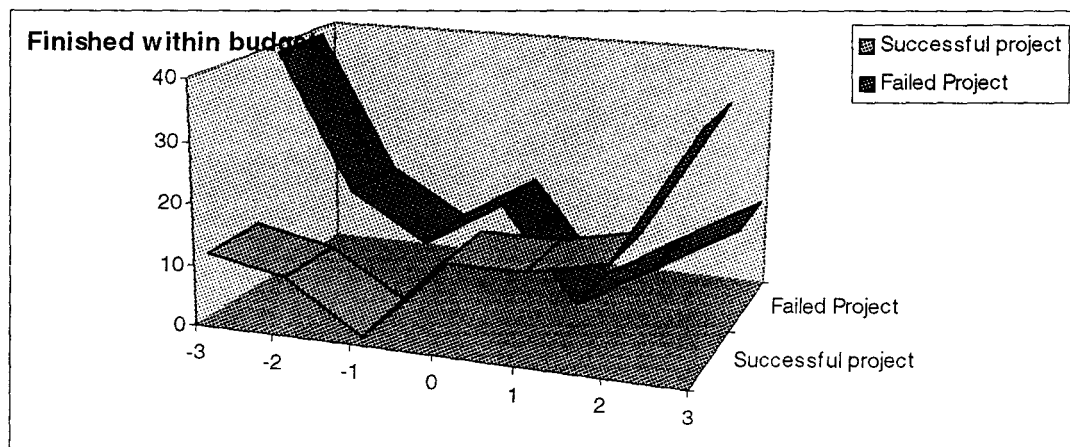
(Survey Data Analysis Continued)

The project had the support of upper management:

A successful project often has upper management's support however, there is no clear trend regarding unsuccessful projects. Since none of the responses were neutral in answering this question it was clear that respondents felt support of upper management had an impact on a project's outcome. The data indicates that lack of management support may not be the primary cause of project failure however, **management support was crucial to ensure a successful project outcome.**
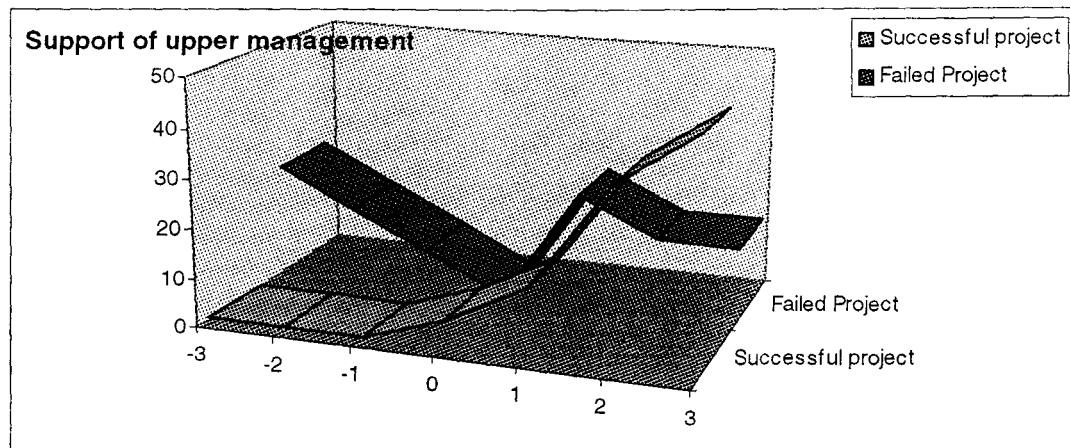

The project finished within budget:

For most respondents budget was used as an evaluation tool; **A project that finished within budget was successful however, a project that did not finish within budget was not necessarily a failure.** A few respondents did not view the budget as a key criteria for success since some projects that did not finish within budget were still considered successful.


17

(Survey Data Analysis Continued)

The budget allocated was adequate:

A project that failed did not directly depend on an adequate budget. The curve for failed projects was flat, and about 30% of the interviewees, for failed projects, felt that the budget was adequately allocated. In contrast, **a key to a successful project outcome was an adequately allocated budget.**
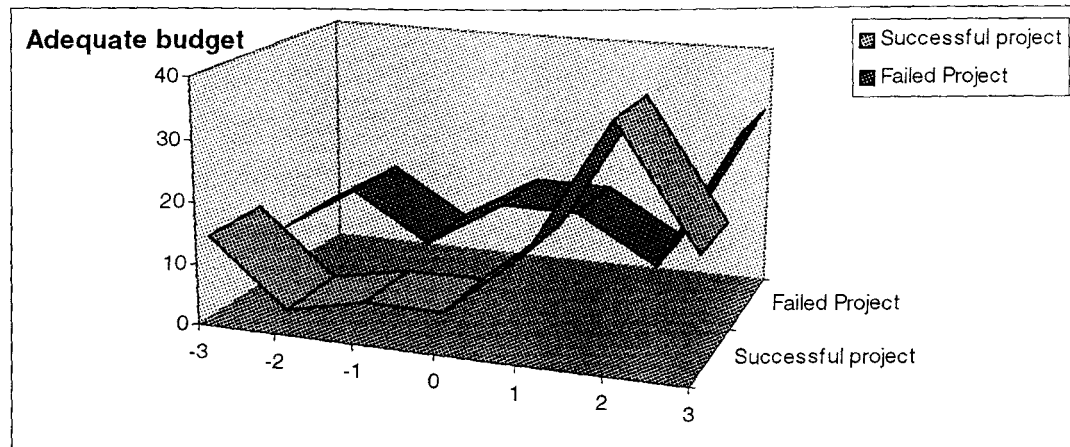
*The project was completed on time:*

The curve for a successful project is flat thus, **time did not appear to be a determinant for successful projects, however it was a major characteristic of failed projects**

18
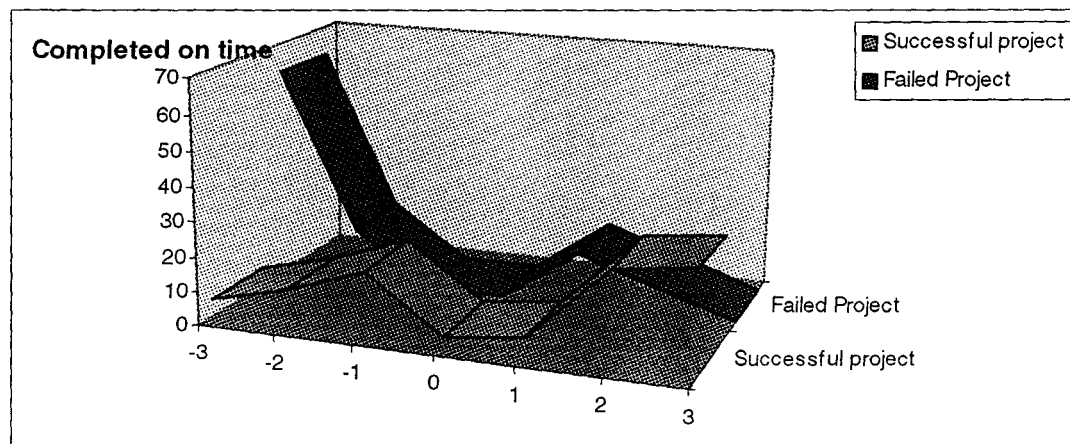
(Survey Data Analysis Continued)

The time allocated for the project was adequate:

In spite of an adequate time allocation some projects were still considered failures and the data was ambiguous for successful projects.   The analysis demonstrated that **adequate time allocation was not a critical factor for project outcomes**.
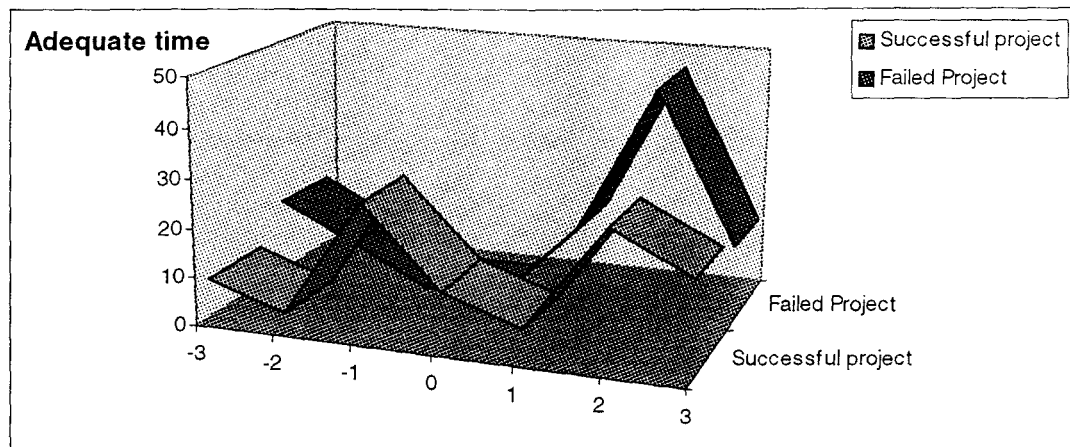
The project team members had authority and resources to accomplish the task:

For successful projects, team members typically had the authority and resources to accomplish tasks; the results were not so clear for unsuccessful projects.

19
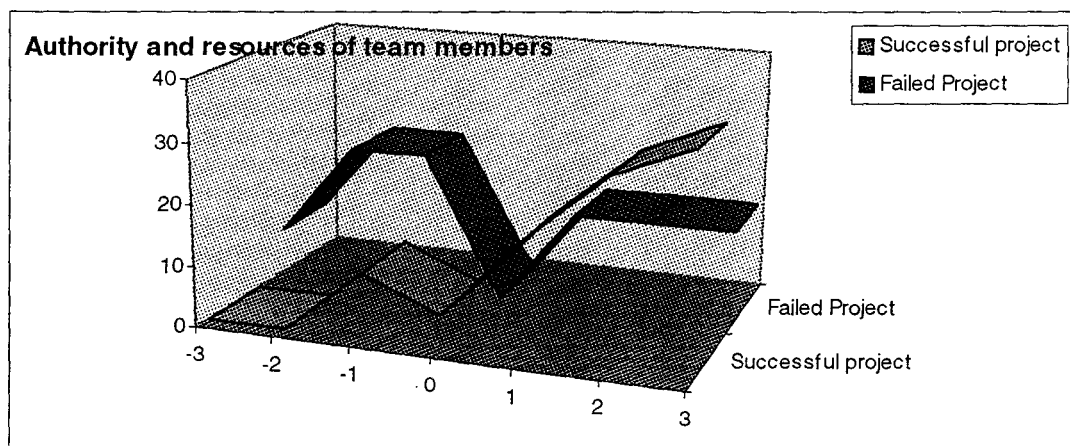
(Survey Data Analysis Continued)

Project team members communicated well together:

Good team communication was a key success factor. However, bad communication did not appear to have a clear impact. The graph strongly suggests that **a project can not be successful without good communication between project team members.**
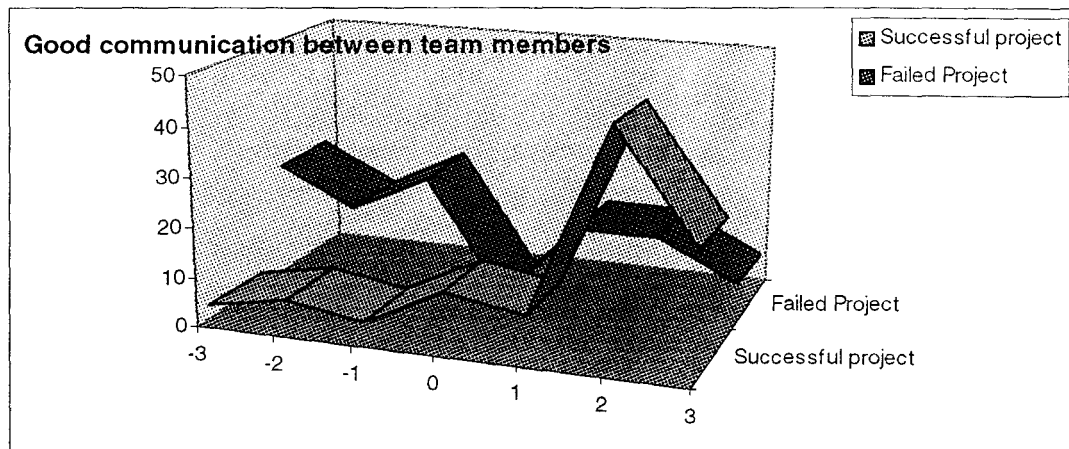
The project team completed user and technical documentation adequately prior disbanding:

This question did not present much information about factors for a project success or failure.
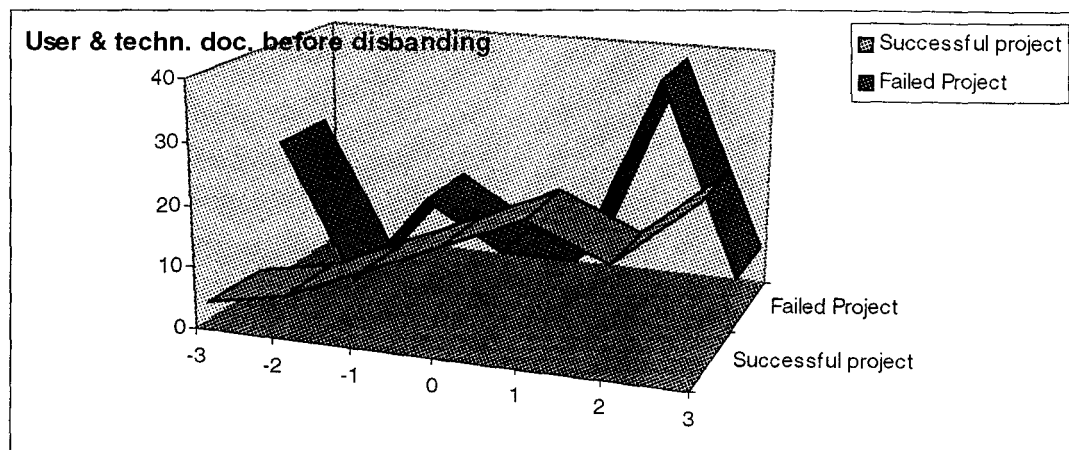
Literature and Survey Comparison

Although every project should be considered individually and studied thoroughly on its own merit there are particular project management techniques, supported by the literature and the survey analysis, that can provide guidance in leading to a successful project outcome.

Comparison of prominent literature with the fifty-one different projects surveyed found the following key indicators of a project's success:[5]

⇒ Meeting objectives
⇒ Meeting expectations
⇒ Warning signs
⇒ Root causes

Objectives

The key project objectives identified by the survey and literature were time, performance and cost. The literature search defined project success as having achieved the project objectives or, more definitively, being within time, cost and at desired performance levels. At the other end of the spectrum is the converse of the above statement or, project failure.

Time: Lack of completion on time, with adequate time allocated, was ranked number one by survey respondents as the primary indicator of project failure. In addition, the survey identified adequate time allocated and completion of the project on time as key factors for success. Time, as a key indicator of project success or failure, was documented profusely throughout the literature researched.

Budget: Respondents to the survey indicated that completion on budget was not a key factor in determining the level of project success. It was however identified as an indicator of success as long as the budget for the project was adequate. In conjunction with survey results the literature supported ensuring project success through planning for and allocating adequate budget resources.

Performance: The survey and literature clearly supported that if the end product did not meet the performance specification required, the project was a failure. However, meeting performance specifications was not the only requirement for a successful project outcome.

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[5] Due to time constraints the survey was generated prior to completion of the literature review. Thus, the survey did not contain many of the project management aspects addressed by prominent literature. This discrepancy limited the comparison of between the survey and literature.

(Literature and Survey Comparison Continued)

<u>Expectations</u>

The literature and survey supported that if time, cost and performance objectives were met a project would be a success; however, the survey did not clearly identify a project as a failure if one or more of the objectives were not accomplished. The survey indicated many things could lead to failure such as: lack of teamwork, poor project management, time-to-market and budget overruns. The only factor in the literature and survey consistently identified as key to project failure was an end item that did not meet user or developer expectations. Not meeting expectations could be in any or all objective categories. For instance if the end product cost more, did not achieve the same return on investment or had different specifications then anticipated the project could be considered a failure.

<u>Warning Signs</u>

The literature and survey demonstrated four key indicators of potential project failure: performance problems, inability to meet time constraints, budget over-runs and communication issues. It was noted that these items indicated poor project planning, teamwork problems and potentially lack of support by upper management or, lack of authority at the project manager level.

<u>Root Causes</u>

The root causes for project failure were poor planning and poor project management.

Project planning encompassed: budget, time and resources. While not planning adequately for these factors did not cause a project to fail absolutely, both the literature and survey indicated that if the budget, time required or resources were not allocated properly the project had a greater potential to fail.

Project management encompassed: team building, expertise of project manager and authority of project manager. Proper project management was highlighted by literature and the survey as the cornerstone to success. If the project manager was inexperience, did not have the respect of the team or lacked management techniques the project typically failed.

Risk Analysis

While the survey and literature indicated many of the same factors influencing a project's outcome there were some limitations of the survey which could potentially impact the statistical analysis. One area was the bias of the survey with regards to how respondents interpreted the "0" on the scale. Several respondents uses the "0" as "don't know" or, "not applicable" while others correctly used the "0" point as a neutral response. Although fifty-one survey's were completed and returned, the number of failed projects analyzed numbered only seventeen which was too small of a sample size to receive statistically significant results. Finally, time limitations prohibited a thorough literature search prior to compilation of the survey. Thus, the survey was generated without incorporating all of the key project management factors identified by prominent literature and was therefore biased by the knowledge limitations of the individuals formulating the survey.

Summary

Pitfalls for Failure

⇒ Ignore the project environment (including shareholders).
⇒ Push a new technology to market too quickly.
⇒ Do not bother building in fallback options.
⇒ When problems occur, shoot the one most visible.
⇒ Let new ideas starve to death from inertia.
⇒ Don't conduct feasibility studies.
⇒ Never admit a project is a failure.
⇒ Micro manage project managers and teams.
⇒ Never conduct post-mortem reviews.
⇒ Never bother to understand project trade-offs.
⇒ Allow political infighting to dictate crucial decisions.
⇒ Make sure the project is run by a weak leader.

Ignore the project environment: A project will be an almost certain failure if it is managed without regard for the organization's external environment, including those project stakeholders who can play an important part in its success or failure. The stakeholders are groups internal or external to the company that have an active stake in the project's development. They include clients, the marketplace, internal functional departments, top management, the project team and external groups. They include consumer groups, social and political groups, community activists, etc.

Push a new technology to market too quickly: New technologies imply new and unknown risks. Sometimes the allure of being first to the market with a new technology causes companies to cut corners, minimize safety factors, or make quality trade-offs. If a product is not adequately tested prior to introduction quality problems could potentially cause long-term profitability issues.

Do not bother building in fallback options: All projects run into trouble at one time or another. Thus, the best method is to face up to the problems and continually ask a series of "What if" questions, before difficulties appear. "What if" scenarios and the responses to them are more successful than those who operate in a purely reactive manner.

When problems occur, eliminate the one most visible: Problems with projects, particularly on a large scale, tend to induce an element of panic from management. It is common in this state to see heads begin to roll, starting with the project manager. Personnel changes in the midst of a project, particularly when an element of urgency has crept in, are typically counterproductive. Because of the learning curve, it takes much longer to bring new personnel up to speed on a project and thus, delaying it further.

Let new ideas starve to death from inertia: The flip side of pushing new technologies out the door without having spent adequate time assessing problem areas is to allow new products to remain in a holding pattern indefinitely. Do not let in-fighting disrupt the flow of creativity or stagnate new ideas.

Do not bother conducting feasibility studies: Feasibility studies require that project managers and upper management devote sufficient time to understanding the project's risks, costs, time frame, customer base and other relevant information associated with the project

(Summary Continued)

Never admit a project is a failure: One of the most difficult lessons to learn about managing projects is to recognize the circumstances when, due to impending or inevitable failure, it is no longer sensible to continue. Making termination decisions is extremely difficult, particularly as it must often be done in the face of resistance from the project manager, team members, and upper management proponents. Sometimes, a common mistake is overreact in the belief that throwing more money at a project will somehow "buy" success.

Micro manage project managers and teams: Some companies have oversight and bureaucracy structures to manage projects. This kind of organization must have a high inertia to react quickly to exploit commercial opportunities or when occur a change in the environment. A project that is micro managed tends to slow product development because the team feels they need management approval prior to making any decisions.

Never conduct post-mortem reviews: Mistakes in a project can occur and sometimes the first inclination is to sweep the results under a rug as quietly as possible. However, the best technique must be to learn from the disaster, so in the future will be possible to recognize problems in advance and avoid them.

Never bother to understand project trade-offs: The project manager is often faced with a series of unappetizing alternatives, for example the trade-off between money and schedule. It is important that the project manager understand the problem very well before making a decision.

Allow political infighting to dictate crucial decisions: Unfortunately in the politicized environment of most firms, many decisions are motivated more by personal agendas than by a desire to satisfy overall corporate needs.

Make sure the project is run by a weak leader: Leadership is an essential ingredient in project success. In the absence of a strong leader to keep the project team operating on track, most projects begin to experience the vacuum of indecision, orders given and rescinded, and a general sense of aimlessness. The key is the project leader. This is the one person who has to make the project succeed by marshaling resources, motivating team personnel, negotiating with shareholders, leading the development process and constantly emphasizing the goal, successful completion of the project.

(Summary Continued)

Keys for Success

The keys for project success as indicated by the survey and literature were:

⇒ Project manager
⇒ Planning
⇒ Communication
⇒ Continuous improvement

Project manager: The project manager is the leader and visionary of the team. He is responsible for developing teamwork and arterials for communication. The project manager should be experienced in the technologies required to complete a project as well as scheduling and management of human behavior. Lack of a strong project manager can lead to team dissension, inadequate contingency planning and fall-back alternatives. While a strong project manager can perform miracles, he cannot do so without the proper level of authority. It is imperative management the project manager have the authority to allocate resources in order to make the project successful.

Planning: Project planning includes forecasting the budget, resources and time required to complete a project within objectives. Planning also encompasses developing schedules to utilize the financial, time and resources efficiently and effectively maximizing a team's potential. Without proper planning the financial or time allocated may be inadequate to complete the project to required performance specifications or to meet time-to-market requirements. Planning resource requirements is also important to ensure manpower and manufacturing capacity are available. If the budget, resources and time constraints are not properly identified up front expectations may be misconstrued and thus, the project is more likely to end in failure.

Communication: A primary contributor to a project's outcome is how well information is disseminated throughout an organization and with the customer. The project team needs to meet frequently to discuss schedules and potential deviations. Only through constant communication can deviations from plan be identified and actions put in place to remedy the situation. While it is important to communicate internally it is equally important to communicate with subcontractors and the customer; expectations must be addressed and redirected as plans change.

Continuous Improvement: Learning from a project's mistakes was not directly addressed in the survey however, respondents of unsuccessful projects noted a lack of disbandment and termination of the project. The literature was very clear that, following the end of a project, the organization should evaluate the project and determine how to improve the project management process. Only through learning from past mistakes and adjusting the process can future problems be alleviated.

Recommendations

The success or failure of projects are not due only to one factor however, one key factor, good project management, stands out amongst the rest. Project management encompasses many things such as planning, evaluating alternatives, reporting and a myriad of other items, but the key elements are team work and communication. Without clearly defined team roles and communicated responsibilities the project is doomed to failure. It is imperative a strong, experienced, project manager be chosen to lead the team.

While choosing a good project manager contributes to success the project manager, is only as effective as his level of authority. Without the proper authority to complete a project on target the project manager lessens his odds of success. When choosing a project manager, senior management should make sure that he has not only has the responsibility, but also the authority to be successful.

Finally, all organizations, no matter how successful they have been, will make mistakes. With every failure there is a potential to learn. Without a method to evaluate a project at completion there is no mechanism to adjust the process and lessen the chance of future failures. An organization so myopic not to learn from mistakes is doomed to repeat them to infinitum. Only by evaluation and continuous improvement can an organization hope to perfect project management.