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The Elusive Target of IT Project Success

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ABSTRACT

This paper presents findings from an exploratory study that investigated how 36 companies operating in three industry sectors in Australia define and measure Information Technology (IT) project success. Our study suggests that when success criteria are formally defined and then measured, IT project outcomes are improved and project resources are better utilized. In addition, those companies with the most effective methods for defining and measuring IT project success shared some important common practices. Based on these findings, this paper presents insights for defining (and improving) project success in complex environments and a model of effective practices.

Keywords

IT Projects, Success, Failure, Empirical studies.

INTRODUCTION

According to Greek Mythology, Proteus was a sea-god able to foretell the future but unwilling to communicate his great knowledge. To get Proteus to give his all-important advice, you would have to capture him first, and that was extremely difficult. Proteus had this great trick of changing his form to avoid capture. Project success is one of those concepts we call *protean*.

Over the years, experienced project managers, project organizations and project researchers have attempted to trap the essence of what is behind project success, a difficult and elusive concept, with many different meanings (Freeman and Beale, 1992). Furthermore, the ascription of success and failure is a social accomplishment dependent on the perspective of the subject (Wilson and Howcroft, 2002).

Thus, success and failure are difficult to define and measure since they mean different things to different people. However, success is also a concept that is critical when we are trying to foretell the future of our projects (Christenson and Walker, 2004). Although IT project failure is considered widespread (Lubbe and Remenyi, 1999; Standish, 2004; Love, Irani, Standing, Lin and Burn, 2005), there is no commonly agreed definition of success and failure (Irani, Sharif and Love, 2001; Wilson and Howcroft, 2002).

Myers (1994) suggests that success is achieved when an information system is *perceived* to be successful by stakeholders. This appear sensible, however, perceptions are influenced by expectations which may be unrealistic (Szajna and Scammel, 1993). Optimistic expectations regarding time, budget or quality can be regarded as part of normal human behavior (Kahneman, Slovic and Tversky, 1982). Given this human tendency, stakeholders with initial optimistic (unrealistic) expectations could perceive as a partial failure a project that was in fact successful in achieving near-optimal results.

We also have to consider that sponsors of a project may view "success as the survival of their project" (Wilson and Howcroft 2002, p.238). In which case, project success may be perceived even if the project did not perform in an optimal manner. How success is defined and who evaluates success therefore affects the final judgment of success and failure (Smithson and Hirschheim, 1998).

However, projects are necessarily different and "[t]he nature of each situation cannot be assessed by a simplistic one-dimensional measure of success" (Saarinen 1996, p.105). Information systems often succeed in one respect but fail in others (Remenyi and Sherwood-Smith, 1999). For example, failure can occur even when the technical system has performed as intended (Wilson and Howcroft, 2002). Also, a project can still be considered successful if it does not meet timescales and budget (Wateridge, 1998). Project success extends beyond technical performance, cost and duration to dimensions such as user satisfaction and benefits.

Thus, it is widely accepted that success is a multi-dimensional construct (Saarinen, 1996); what is not agreed is which dimensions best represent success (Rai, Lang and Welker, 2002). The aim of our study was to gain a better understanding of how companies define and measure IT project success, and the value of this practice departing from the following questions:

1. How do organizations in Australia define IT project success?

2. Which methods are most effective and why?

We have organized the rest of the paper in the following five sections: literature review, research method, results, discussion, and conclusion.

LITERATURE REVIEW

Cooke-Davies (2002) distinguishes between project management success being measured by time, cost and quality, and project success which is measured against the overall objectives of the project. Project management success is subordinate to and may also contribute to project success (Baccarini, 1999). Successful projects are more likely to emphasize project success criteria rather than project management success criteria; however, project management success is much easier to measure because it is less complex and can be assessed at project closure (Jugdev and Muller, 2005).

Success, for IT projects, is not a 'black and white' concept (Wateridge, 1998). It can be viewed as a combination of project implementation success and systems success (Espinosa, DeLone and Lee, 2006). Information systems (IS) success can be separated into three levels: technical development, deployment to the user and delivery of business benefits (Ballantine, Bonner, Levy, Martin, Munro and Powell, 1996) or treated as a four-dimensional construct consisting of the success of the development process, success of the use process, quality of the IS product, and impact on the organization (Saarinen, 1996). DeLone and McLean (1992) propose six major dimensions of IS success, which they refine to include: system quality, information quality, service quality, use, user satisfaction and net benefits (DeLone and McLean, 2004).

However, user satisfaction as a measure of success has been criticized for lacking strong theoretical underpinnings (Gatian, 1994; Goodhue, 1995). Additionally, while *use* is considered a necessary condition for success (Saarinen, 1996); frequent or widespread use is not considered necessary for success with some information systems such as data warehousing (Wixom and Watson, 2001). Furthermore, it is reasonable for companies with innovative strategies to expect and accept some level of project failure. It should also be noted that even when specific system implementations fail, net benefits and organizational success could be achieved by transforming the initial project failure into organizational learning (Irani et al., 2001).

The difficulties with defining success mean that many projects are initiated without a clear statement of what will be regarded as success (Remenyi and Sherwood-Smith, 1999). Conversely, having an inspiring vision of what the project is meant to achieve is in itself a significant driver of project management success (Christenson and Walker, 2004). Thus, negotiating a definition of success among key stakeholders before the start of a project and at several review points during the project's lifecycle has been recommended as a good project management practice (Jugdev and Muller, 2005).

According to DeLone and McLean (2004), net benefits address the ultimate impact of a system and therefore represent the most important category of success measurement. However, "success criteria in terms of benefits delivered are the exception rather than the rule, and in many cases measures of project success are defined after project implementation or not at all" (Lubbe and Remenyi 1999, p.146). Benefits can be difficult to measure, and are often different to those anticipated when the IT project is first proposed (Farbey, Land and Targett, 1992). This raises issues of whether success should be judged against the original estimate, a revised target or some other performance benchmark.

Furthermore, formal *ex-post* evaluations are often not conducted because of political agendas (Smithson and Hirschheim, 1998). The political motivation to avoid evaluation stems from the perception that evaluations are about finding failures and thus result in negative outcomes, such as embarrassment, for managers (rather than being a learning experience). This perception is important because "as long as managers perceive personally negative consequences irrespective of the outcome of ex post evaluations, a strong disincentive to undertake them exists" (Gwillim, Dovey and Wieder 2005, p.315).

In short, having a clear and well-defined perception of what has to be achieved to attain success may indeed contribute to achieving the seemingly evasive target of project success. While the extant literature has focused on measuring the rate of IT project failure, understanding the causes of failure, and developing tools and techniques to improve project success (Wilson and Howcroft, 2002), few studies have examined how project success is defined in practice, and, more to the point, the implications of defining and measuring project success on project outcomes.

Perhaps this is not surprising, given the *protean* nature of success; however, this problem presented an important and interesting question that guided our research. We wanted to investigate if the way organizations define project success can be an important element when trying to foretell the future of their projects. Thus, we conducted semi-structured interviews with 72 senior managers in 36 companies operating in three industry sectors, as described in the next section.

RESEARCH METHOD

A qualitative approach was adopted because it allowed a good exploration of project success. The analysis of rich qualitative data is a good strategy for discovery, offering a "strong potential for revealing complexity" (Miles and Huberman 1994, p.10).

Three industry sectors were selected: Finance and Insurance (F&I); Mining (M); and Electricity, Gas and Water Supply (EG&WS). These sectors offered varying levels of IT investment and covered a range of practices. The sample of companies was derived from a combination of opportunistic and snowball sampling, which is relevant for theory-building (Miles and Huberman, 1994). Table 1 summarizes the participant companies by industry sector, size, focus of operations, and ownership.

Sector	Size (Annual Revenue)			Focus of Operations			Primary Ownership			
	<A$500m	≥A$0.5 ≤A$2b	>$A2b	AU State	AU National	International	AU Public	AU Private	Government	International
F&I	9	7	4	7	8	5	6	9	1	4
M	2	5	4	1	2	8	7	1	0	3
E,G&WS	0	4	1	4	1	0	0	0	5	0
Total	11	16	9	12	11	13	13	10	6	7

Table 1: Mix of participant companies, by industry sector

Our examination of IT project success was part of a broader exploratory study of effective IT project evaluation practices. The interview process investigated evaluation at various stages of the project lifecycle, both *ex-ante* and *ex-post*. Two one-hour (average) interviews were conducted in each company. The primary interview was with a Chief Information Officer (CIO), Program Office Manager or equivalent. This interview focused on evaluation practices in the participant company in general, including the company view of success and failure. A secondary interview was then conducted with a Project Manager and explored evaluation of a recently completed IT project, whether the project was a success and how success was determined. We wanted to gather participants' perceptions as they are a reasonable proxy for objective measures since they have been found to correlate strongly in research of IT business value (Tallon, Kraemer and Gurbaxani, 2000). Additionally, following Yin (2003), 362 documents relating to project management and evaluation practices were also collected and analyzed for contextual, informational and triangulation purposes.

The 36 companies were first individually analyzed based on the interviews and sample documents. Definitions of success were coded and allocated to categories based on the dimensions of success in the prior literature. A meta-matrix (Miles and Huberman, 1994) was then developed listing all of the companies with a description of how success and failure were defined, the criteria used to judge success, the formality of the success construct, whether a company measured success, how it measured success, how effective this measurement was, and why it was effective or ineffective. The formality of the success construct and the effectiveness of measurement were rated based on the descriptions provided by participants using a scale of high, medium or low. In this context, effectiveness is the capacity to produce a positive effect in the way companies operationalize their evaluation practices; thus, effectiveness was defined by the participants to include concepts such as accuracy, consistency, timeliness and usability of results.

The companies were then divided into three categories based on the primary interview participant's rating of *confidence* that IT projects are producing business benefits. The practices used to define and measure success were then compared across groupings, in particular how the level of confidence related to the formality of the success construct and the effectiveness of measurement. While the general approach was to look for patterns in practices, it was also recognized that effective practices may come from a single company. Both similarities and differences were examined across companies.

RESULTS

DEFINITIONS OF SUCCESS

The criteria used by companies to define success were coded and grouped into three categories: project management success, technical success and business success. The criteria used by investigated companies are summarized in Table 2. Stakeholder satisfaction and customer/user satisfaction were considered both project and technical success criteria since an element of satisfaction may be related to both the technical result and the management of expectations by the Project Manager.

Companies considered between 2 and 11 success criteria, with an average of 5. While there was a focus on the standard project management criteria of 'on-time' and 'on-budget', 72% of these companies considered business success criteria such as 'delivery of benefits', 'met business objectives' and 'business continuity'.

Success Criteria	Category		
	Project Management	Technical	Business
On-time	X		
On-budget	X		
Sponsor satisfaction	X		
Steering group satisfaction	X		
Project team satisfaction	X		
Customer/user satisfaction	X	X	
Stakeholder satisfaction	X	X	
System implementation		X	
Met requirements		X	
System quality		X	
System use		X	
Business continuity			X
Met business objectives			X
Delivery of benefits			X

Table 2: Criteria used to judge success

The results highlighted several success criteria which are rarely considered in the literature: 'sponsor satisfaction', 'business continuity', 'project team satisfaction', and 'steering group satisfaction'. 'Business continuity' referred to the level of disruption that an IT project had on business operations, including any negative impact on customers, the stopping of production or embarrassment to the company. A focus on benefits exclusively may not always pick up the unintended negative effects on the business which are covered by the 'business continuity' criterion.

> *"We sometimes may need to slip budget and schedule to ensure that there is no negative impact on operations" (IS Program Office Manager, M6).*

About one-third of companies used a highly formal success construct and about one-third had no formally agreed success construct. Most companies considered at least one success criteria from each of the three categories, with several companies using success 'sliders' (a visual technique using sliding scales to determine the relative importance of key criteria) or a balanced scorecard approach[6]. Some companies also consciously split success into project management success and business success.

[6] The "sliders" technique was popularized in Australia during the 1990s by Rob Thomsett, a tireless roving teacher and champion of project management (see Thomsett, 1993).

There was recognition in these companies that it was possible to have project management success without business success, and vice versa. Success was more than just meeting the requirements detailed in the Business Case. One CIO noted that if his team did not accurately capture business requirements then they may have an unhappy customer even if they met the requirements which were documented. Also satisfying the customer, or stakeholders, may not constitute success overall if company goals have not been met. Thus it may be possible to satisfy customers or users but not produce benefits for the company.

THE RELATIONSHIP BETWEEN SUCCESS AND CONFIDENCE

Participants were asked to rate their confidence that IT projects are producing business benefits for their company, using a scale of high, medium and low. High levels of confidence in IT project outcomes resulted from many factors. However, the main reasons given related to effective *ex-ante* approval processes, effective *ex-post* measurement of results or a combination of both.

Table 3 groups companies by formality of success construct, effectiveness of measurement and overall confidence. The results provide support for the proposition that companies who formally define and effectively measure success have higher levels of overall confidence that their IT projects are producing benefits. 36% of the companies had a highly formal success construct, effective measurement of success, and medium to high levels of overall confidence (groups 1, 2 and 3). In addition, 25% of the companies had no formal success construct and seven of these companies had low to medium levels of overall confidence (groups 9 and 10).

Group	Companies	Formality of Success Construct	Measurement of Success	Effectiveness of Measurement	Overall Confidence
1.	F2, F3, F4, F5, F9	High	Yes	High	High
2.	F14, F16, M6, U5	High	Yes	Medium	High
3.	F13, F15, M1, M8	High	Yes	Medium	Medium
4.	F10, M11	Medium	Yes	Medium	High
5.	F18, M7	Medium	Yes	Low	High
6.	F6, F8, F11, M10, U3, U4	Medium	Yes	Medium	Medium
7.	F1, F7, F20, M9	Medium	Yes	Low	Medium
8.	F17, M5	Low	No	Low	High
9.	F19, M3, U1, U2	Low	No	Low	Medium
10.	F12, M2, M4	Low	No	Low	Low

Table 3: Formality of success, measurement of success and confidence

Some companies had high levels of confidence despite having no formal success construct or ineffective measurement of success (groups 5 and 8). For three companies this may be explained by their size. These companies were relatively smaller companies and perceived less need for formal processes since they managed less IT projects. For another company, the high level of confidence was the result of rigor in their approval processes. In addition, the results suggest that in some circumstances simply defining success and having the intent to measure may have a positive impact on IT project outcomes, irrespective of how effective the actual measurement is.

Given these results, it seems reasonable to suggest that companies that defined success upfront and then measured results after implementation had greater confidence in IT project outcomes.

EFFECTIVE PRACTICES

Those companies that had a formal success construct, effective measurement of success, and medium to high levels of confidence shared some important common practices. These effective practices were: (a) an agreed definition, (b) consistent measurement, and (c) use of results. Each of these practices is now discussed in more detail.

AN AGREED DEFINITION

Those companies with a formal success construct and high levels of confidence varied in how they defined success. Some of these companies used a balanced scorecard, some used success 'sliders', and others used a combination of project delivery measures and benefits realization. However, what was common across these companies was that their definition of success was widely understood and agreed, a balance of success criteria were used (about five), there was a clear distinction between project management success and business success, and there was a clear focus on the delivery of benefits. These companies either had a company wide definition of success or agreement between the project team and sponsor (or steering group) on the definition of success at the start of a project.

Several participants suggested that the practice of defining success upfront (in the Project Charter) created a common understanding between the sponsor and the project team of how performance would be judged and what was important, which helped with managing and meeting expectations. Companies F4, F13, F14, F16, M1 and U5 all weighted their success criteria at the start of a project and made project management adjustments during the project in accordance with the relative importance of the selected criteria. For example, company F13 weighted the four perspectives of a balanced scorecard (Financial, Customer, Process and Team), while company F16 weighted five criteria which they called 'sliders'.

> *"For each project the management team or Steering Committee ranks the five most important 'sliders' for a project from the following list: on-time, on-budget, value added back to the organization, meeting its objectives and quality of delivery. They are called 'sliders' because the project is tracked by these and as the project progresses these may be adjusted. However, they also indicate what 'levers need to be pulled' and when a project should be stopped" (CIO, F16).*

The five companies that had formal success criteria, effective measurement and high confidence all used 'delivery of benefits' as a key criterion for success. For these companies there was also a clear distinction between project management success and business success. For example, company F5 measured two facets of success: project delivery and business benefits. Project delivery was measured by quality, delivery to schedule and delivery to costs (QDC). Business benefits were measured using key performance indicators (KPI).

> *"A successful project will achieve a 16 or better QDC and achieve 100% or better aggregate KPI. We are now expected to deliver on all KPI targets and if we achieve 100-120% there are more incentives. However, it is capped at 120% because we do not want people under-estimating benefits" (Project Portfolio Manager, F5).*

Nine companies had no formally agreed success construct. The CIOs, Program Office Managers and Project Managers of these companies tended to describe success in simpler terms, with only one mentioning 'delivery of benefits' as a criterion (and also noting that they did not actually measure this). These companies considered an average of four criteria with the main ones being 'on-time', 'on-budget', 'met requirements', 'system implementation' and 'system use'.

> *"Typically success equals implementation and use. If the project goes to term and gets delivered (a lot do not) and people are using it, it would be judged a success" (Team Leader IT Project Management, F12).*

In addition to the practices associated with a formally agreed definition of success, we found several practices associated with the consistent measurement of success.

CONSISTENT MEASUREMENT

With regards to measuring success, 75% of the companies attempted to measure success but only five were highly effective at doing so. Identification and measurement of costs and benefits was identified as a major challenge by most companies. In terms of benefits, only 55% of the companies said that they identify all benefits and 28% said that they adequately measure them.

For some companies there was a cultural reluctance to measure success or failure. For company M3 there was no accountability for project results and managers did not conduct post-implementation reviews since it was often not in their best interests to do so.

> *"There is a cultural reluctance to define a project as a failure. At the end of a project there is not really a formal judgment of success" (MIS Service Delivery Manager, M3).*

Post-implementation reviews were often only conducted for larger projects or when 'things went wrong'. The reasons for not conducting post-implementation reviews or benefits realization included lack of management support, unclear ownership of processes, limited accountability, resource constraints, difficulties with measurement and attribution, and inadequate use of

evaluation results. Only five companies clearly defined success and then measured success using a post-implementation review, a benefits realization process or (most often) a combination of both.

> *"A project is successful if I still have a job! We do not assess projects formally and do not have a good track record for implementing IT systems. It is difficult to get a straight answer on success if you don't do a post-implementation review or benefits realization, which we do not" (ICT Program Officer Manager, U2).*

The consistent measurement of success was a product of a formal measurement process during the project, at project closure and following implementation. Companies who were highly effective at measuring success, such as F2, F3, F4, F5 and F9, measured project management success using a post-implementation review and tracked benefits for 6-12 months after implementation. Often the post-implementation review was at the six month point and then ongoing benefits tracking occurred, as required. For company F3 benefits were tracked "until the Governance Committee was satisfied". In comparison, companies such as F1 and F18, attempted to measure benefits at project closure which was too soon for benefits to be realized.

> *"The post-implementation review is focused on closure but should be 12-18 months out, not at the end of a project. It is difficult to claim benefits after the system has just been put in" (Head IT Architecture, F1).*

Ex-post evaluations were both consistently completed and completed consistently when the process was managed by a Program Management Office (or equivalent) and there was an independent verification of success. Program Management Offices were used to ensure evaluation processes were applied consistently, to track benefits after a project team had been disbanded, and to improve project management practices. The need for an independent group to manage the process was even more important for companies such as M10 where the Project Managers were contractors and left the company shortly after the completion of a project.

There was a view expressed by some companies that the evaluation of a project should not be conducted by the project team or sponsor, since they had a vested interest in the outcome. This was particularly relevant for companies where project success was linked to performance appraisals and rewards. Companies that effectively managed this tension between performance incentives and the desire to over-report success used formal systems focused on measurement rather than just perceptions, and also independently verified results.

The consistent measurement of success provided the basis for improvement, both of project delivery and benefits delivery. Companies such as F3 and F5 spoke of using measurement to modify implementations or company processes in order to "drive out benefits". Measurement also allowed companies the opportunity to stop projects in a controlled manner. Thus measurement provided the basis to improve IT project outcomes and the use of project resources.

USE OF RESULTS

We found that those companies with high levels of confidence in their IT projects not only agreed on a definition of success and consistently measured success: they also used the results. This included the management of the project according to the agreed definition of success, a willingness to stop projects, accountability for results, and a connection to learning.

Companies who used results effectively were willing to re-direct project resources based on the *a priori* understanding of the relative importance of project success criteria and were willing to stop projects. This resulted in improved project management and better use of resources. In contrast, companies such as F19 and F6 considered cancellation of a project as a failure in itself.

> *"The company is willing to admit its failures. We use earned value management to get early visibility and avoid surprises. If we are getting a surprise then we have failed" (IS Program Office Manager, M6).*

Companies that held business managers accountable for results had the most effective evaluation practices. Accountability was found to drive positive behaviors, improving both the consistency of measurement and the willingness of managers to act. Furthermore, it appeared that accountability addressed many of the significant evaluation challenges identified by companies, in particular business engagement and ensuring the accurate estimation of costs and benefits. The fundamental principle was that if managers were held accountable then evaluation got done and results were used.

Companies without accountability for results tended to complete *ex-post* evaluations inconsistently or not at all. There also appeared to be a greater tendency for political behavior.

> *"Generally the view is that over-time or over-budget is failure but benefits are not considered. There have been plenty of large disasters but in reality they are not presented as failures since the sponsor will 'spin doctor' the results" (ICT Program Office Manager, U2).*

Accountability for results was enforced through formal project reporting, performance incentives, individual appraisals and department budgets. This encouraged the sponsor to take ownership of the project which was often seen as a critical project success factor. Accountability for results also translated to the project team. By focusing performance incentives for the project team beyond simple project management criteria, the focus of the team was shifted to outcomes which encouraged them to work more closely with the business in order to achieve a result. Where the performance of a project manager was judged simply on their ability to deliver a project on-schedule and on-budget then achieving overall business results was less likely.

> *"Success is defined by the post-implementation review and a Balanced Scorecard for each project. A bonus of up to 30% of the project team's remuneration is based on the Balanced Scorecard" (Associate Director IT Development, F13).*

The measurement of success using a post-implementation review provided the basis for lessons learned. However, only five companies were satisfied with their overall use of evaluation results. In particular most companies who had post-implementation review processes made very little use of the findings from these reviews to improve processes or learn corporately. Where lessons learned were captured, used to drive process improvement and then shared, companies reported improvements in the estimation and management of future projects. This appeared to be the result of company culture and not just formal processes.

> *"The results of the post-implementation review are reviewed by the Program Management Office and senior management for improvements and feed into the project improvement program. There is an entrenched attitude to look for improvements and understand issues rather than hide problems or persecute the Project Manager" (Project Portfolio Manager, F5).*

The measurement of success was rarely an end in itself. Results were used for the continuous improvement of project management and estimation, and also reinforced the use of *ex-post* evaluation processes.

DISCUSSION

Although there is extensive literature on the topic of IT project success, few studies have examined how project success is defined in practice, and the implications of defining and measuring success on project outcomes. The key finding of this study is that companies who clearly define and effectively measure the elusive concept of IT project success have a greater chance of achieving success.

We found that companies that formally defined success, consistently measured success and acted on the results, had improved IT project outcomes and better utilized project resources. These three practices all contributed towards project success (although it is unlikely they would be able to prevent failure). There was no one best method for defining and measuring success. However, companies that did so effectively used a balance of success criteria, clearly distinguishing project management success from business success. These companies agreed on the definition of success before a project and focused on the delivery of benefits to the company. Measurement of benefits generally occurred 6-12 months after implementation and was reinforced by accountability, supported by a Program Management Office and linked to corporate learning.

One may expect bias in the self-reported performance of the interviewed CIOs, Program Managers and Project Managers, given their role as providers of IT projects to the company; however, we did not find evidence of this. In contrast, those interviewed were willing to openly discuss failures and problems with their evaluation practices. A possible explanation to this is that the interviewer was perceived as an expert causing participants to feel that they were talking to a peer who could understand their problems. Yet, we maintained openness and skepticism, triangulating the views of the interviewees within each company whenever possible and seeking further evidence from their documents.

The findings from our study are based on evidence from 36 companies in three industries in Australia, and the design raises some generalization issues. For other than random samples, Seddon and Scheepers (2006) argue that generalization relies on the 'representativeness' of the sample. Since the 36 companies in this study are a diverse range of organizations by size, focus of operations and ownership, and since the practices identified are related to management issues known to be important the world over, it is argued that the findings probably apply to most organizations, even if generalization was not a goal of this exploratory study. These findings may also be applied to program and portfolio success since they are aggregates of project success; however, more research is required in this area.

Conclusion

This paper set out to show how important it is to capture what success means to an organization in order to achieve success. Qualitative analysis of interviews with 72 senior managers in 36 companies in three industries was used to determine definitions of success and how these related to confidence that IT projects were producing benefits to the company. Our study found that the very act of defining and measuring IT project success contributed to success itself.

Based on our analysis, three effective practices were identified: (1) an agreed definition of success, (2) consistent measurement, and (3) the use of results. Simply, if you know what you are looking for, track your progress and are willing to alter your path, then your chances of finding success are better.

In Greek Mythology, Proteus is compelled to foretell the future once captured. Project success is likely to remain *protean* in nature; a difficult and elusive concept that means different things to different people. However this paper goes some way to showing that once captured, the way companies define success can contribute to foretelling the future of their projects. These conclusions provide important insights for improving the identification and measurement of IT project success, and ultimately, IT project outcomes.

REFERENCES

1. Baccarini, D. (1999) The logical framework method for defining project success, *Project Management Journal,* 30, 4, 25-32.
2. Ballantine, J., Bonner, M., Levy, M., Martin, A., Munro, I. and Powell, P. (1996) The 3-D model of information systems success: the search for the dependent variable continues, *Information Resources Management Journal,* 9, 4, 5-14.
3. Cooke-Davies, T. (2002) The 'real' success factors in projects, *International Journal of Project Management,* 20, 3, 185-190.
4. Christenson, D. and Walker, D. (2004) Understanding the role of 'vision' in project success, *Project Management Journal,* 35, 3, 39-52.
5. DeLone, W. and McLean, E. (1992) Information systems success: the quest for the dependent variable, *Information Systems Research*, 3, 1, 60-95.
6. DeLone, W. and McLean, E. (2004) Measuring e-commerce success: applying the DeLone and McLean information systems success model, *International Journal of Electronic Commerce*, 9, 1, 31-47.
7. Espinosa, J., DeLone, W. and Lee, G. (2006) Global boundaries, task processes and IS project success: a field study, *Information Technology and People*, 19, 4, 345-370.
8. Farbey, B., Land, F. and Targett, D. (1992) Evaluating investments in IT, *Journal of Information Technology*, 7, 109-122.
9. Freeman, M. and Beale, P. (1992) Measuring project success, *Project Management Journal,* 23, 1, 8-17.
10. Gatian, A. (1994) IS user satisfaction: a valid measure of system effectiveness? *Information and Management,* 26, 3, 119-131.
11. Goodhue, D. (1995) Understanding user evaluations of information systems, *Management Science*, 41, 12, 1827-1844.
12. Gwillim, D., Dovey, K. and Wieder, B. (2005) The politics of post-implementation reviews, *Information Systems Journal*, 15, 307-319.
13. Irani, Z. and Love, P. (2001) The propagation of technology management taxonomies for evaluating investments in information systems, *Journal of Management Information Systems*, 17, 3, 161-177.
14. Irani, Z., Sharif, A. and Love, P. (2001) Transforming failure into success through organizational learning: an analysis of a manufacturing information system, *European Journal of Information Systems,* 10, 55-66.
15. Jugdev, K. and Muller, R. (2005) A retrospective look at our evolving understanding of project success, *Project Management Journal,* 36, 4, 19-31.
16. Kahneman, D., Slovic, P. and Tversky, A. (1982) *Judgement under uncertainty: heuristics and biases*, Cambridge University Press, Cambridge.
17. Love, P., Irani, Z., Standing, C., Lin, C. and Burn, J. (2005) The enigma of evaluation: benefits, costs and risks of IT in Australian small-medium-sized enterprises, *Information and Management*, 42, 947-964.
18. Lubbe, S. and Remenyi, D. (1999) Management of information technology evaluation – the development of a managerial thesis, *Logistics Information Management*, 12, 1, 145-156.

19. Miles, M. and Huberman, A. (1994) *Qualitative Data Analysis: An Expanded Sourcebook*, Sage Publications, California.
20. Myers, M. (1994) Dialectic hermeneutics: a theoretical framework for the implementation of information systems, *Information Systems Journal*, 5, 51-70.
21. Rai, A., Lang, S. and Welker, R. (2002) Assessing the validity of IS success models: an empirical test and theoretical analysis, *Information Systems Research*, 13, 1, 50-69.
22. Remenyi, D. and Sherwood-Smith, M. (1999) Maximize information systems value by continuous participative evaluation, *Logistics Information Management*, 12, 1, 14-31.
23. Saarinen, T. (1996) An expanded instrument for evaluating information systems success, *Information and Management*, 31, 103-118.
24. Seddon, P. and Scheepers, R. (2006) Other-settings generalization in IS research, *Proceedings of the Twenty-Seventh International Conference on Information Systems*, 1141-1158.
25. Smithson, S. and Hirschheim, R. (1998) Analyzing information systems evaluation: another look at an old problem, *European Journal of Information Systems*, 7, 158-174.
26. Szajna, B. and Scammel, R. (1993) The effect of information system user expectations on their performance and perceptions, *MIS Quarterly*, 17, 4, 493-516.
27. Standish Group International (2004) *Chaos Report*, 3rd Quarter, The Standish Group International, USA, www.standishgroup.com
28. Tallon, P., Kraemer, K. and Gurbaxani, V. (2000) Executives' perceptions of the business value of information technology: a process orientated approach, *Journal of Management Information Systems,* 16, 4, 145-173.
29. Thomsett, R. (1993) *Third wave project management: a handbook for managing the complex information systems of the 1990s*, Prentice Hall, Englewood Cliffs, N.J.
30. Wateridge, J. (1998) How can IS/IT projects be measured for success? *International Journal of Project Management*, 16, 1, 59-63.
31. Wilson, M. and Howcroft, D. (2002) Re-conceptualizing failure: social shaping meets IS research, *European Journal of Information Systems,* 11, 236-250.
32. Wixom, B. and Watson, H. (2001) An empirical investigation of the factors affecting data warehousing success, *MIS Quarterly*, 25, 1, 17-41.
33. Yin, R. (2003) *Case Study Research: Design and Methods*, 3rd ed., Sage Publications, California.