TESTING HAMMER AND STANTON'S REENGINEERING-SUCCESS DIAGNOSTIC

Felicity Murphy
Peter Seddon
Sandy Staples*
Department of Information Systems
The University of Melbourne
Melbourne, Australia
E-mail: fmurphy@studentmail.dis.unimelb.edu.au
p.seddon@dis.unimelb.edu.au

*Queens School of Business
Queens University
Kingston, Ontario, Canada
E-mail: sstaples@business.queensu.ca

ABSTRACT

Business Process Reengineering (BPR) is no longer referenced in academic literature with the regularity that it was in the heady days of the mid-nineties but it is still in use in Australian organisations. We are also changing processes radically as new software is implemented or new electronic markets are embraced and the lessons of reengineering can be applied to these process changes.
This study makes three main contributions by: (1) investigating the organisational context prior to the embarkation on projects of major change in Australia, (2) testing the validity of a diagnostic proposed by Hammer and Stanton (1995) to be used when assessing the ability of organisations to succeed at reengineering, and (3) examining the impact of the organisational environment prior to change on the outcome of reengineering projects.

KEYWORDS:

Business process reengineering (DD0402)

INTRODUCTION

Business process reengineering (BPR) has been an important phenomenon. Brancheau, et al. (1996) found that in 1994/5 the second most important issue faced by top managers was "Facilitating and managing business process redesign". Although reengineering has ceased to be a fashionable topic for research, the fundamental lessons it taught us about embarking on programs of radical change hold true and can provide guidance when undertaking future rounds of major organizational reconstruction.

The idea of making major changes to business processes, as advocated by reengineering, has become commonly accepted. In much of the literature on enterprise systems (also known as ERP systems) it is often recommended that business processes should be modified to fit the "best-practice" processes embedded in the system (Davenport, 1999). Organisations are also changing their processes in response to the electronic commerce imperative. James Champy (1998) recognised the ongoing need to reengineer processes in response to the increase in "digital commerce" places firms under pressure to "restructure the entire organisation". Given the ease with which organisations are now persuaded to change business processes the lessons to be learned from reengineering should not be overlooked.

Since 1990 when the seminal reengineering work by Michael Hammer (1990) appeared in the Harvard Business Review there has been much academic research done on the critical success factors for implementing reengineering projects. This work has, however, overlooked the importance of the organisational context prior to embarkation on a reengineering project. It has focussed, instead, on conduct during implementation (e.g., Grover et al.,1995, Clemons et al., 1995, Hall et al., 1993, Miles et al., 1995, Broadbent & Weill 1995, Broadbent et al. 1996, Butler 1993 & 1997). This suggests that understanding of how the organisational context prior to reengineering (or other major organizational change projects) impacts the outcome of the project is limited.

With this in mind we undertook a study in Australia that examined reengineering practices and the context that existed at the time of the decision to reengineer but prior to the beginning of the reengineering project. In particular, we wanted to investigate the validity of a diagnostic instrument proposed by Hammer and Stanton (1995) that purported to help managers decide if their organization was ready to embark on a reengineering project. In Chapter 6 of their book, Hammer and Stanton offer a list of 20 questions, grouped as three factors or themes, and suggest that certain minimum scores should be attained for each factor and the overall score before reengineering is attempted. Thus the research question addressed in this paper is as follows:

> ***Does the diagnostic proposed by Hammer and Stanton really predict whether organisations are well positioned for reengineering success?***

Business Process Reengineering was defined at the outset of our study as:

> A deliberate (planned) change, typically enabled by information technologies in an attempt to redesign a business process to achieve performance breakthroughs in measures such as quality, speed, customer service, and cost. (Grover et al., 1995).

The remainder of this paper is organised as follows. The next section summarises the literature about successful reengineering projects. The third section describes the methodology used in our study. The fourth section presents the results. In the final section, the results are discussed and implications for practice and research are offered.

A REVIEW OF THE REENGINEERING LITERATURE

In an extensive review of the reengineering literature Grover et al. (1995) found that there are six main factors which effect the implementation of projects. These factors are shown in the left-hand column of Table 1. Coming from the practitioner literature, Hammer and Stanton (1995) emphasised that management support, planning and scoping of reengineering projects, and change management could begin long before an organisation embarked on implementation. This recognition was embodied in a diagnostic they proposed requiring practitioners to consider three factors before making the decision to start reengineering. These three factors are shown in the right-hand column of Table 1. Clearly there is some overlap in these factors. In this paper, we focus on the three factors that Hammer and Stanton (1995) believe are important prior to embarkation on a reengineering project. Each of these is now discussed in turn.

Grover et al. (1995) Factors affecting reengineering success	Hammer and Stanton (1995) Themes (pages 86-90)
Change Management Technological Competence Process Delineation Project Management Project Planning Management Support	Reengineering Leadership Organisational Readiness Style of Implementation

Table 1: Reengineering Success Factors during the project (Grover et al., 1995) and before embarking on the project (Hammer and Stanton, 1995).

Reengineering Leadership

Hammer and Stanton's (1995) first pre-embarkation factor for reengineering success is Reengineering Leadership. The first six questions in their self-assessment diagnostic assess aspects of the leader's vision and commitment to the project. Elsewhere in the literature, "management support and leadership" in reengineering efforts has also been identified as perhaps the most significant contributing factor to the success of an initiative. Keen (1995) suggests that effective managers understand how to lead an organisation through radical changes by combining a tenacious pursuit of the performance objectives with the flair for building organisational consensus at all levels. Top management support is necessary to develop faith throughout the organisation in the radical changes proposed and a respect for the project team (Hall et al. 1993, Hoopes 1995, Grover et al., 1995). Hall (1993) states strongly that reengineering "will fail without the full commitment of senior executives ... supplying reengineering with all resources required: the best people, investment in IT and skills training."

Hammer in an interview with Moad (1993) stated that "reengineering requires two things to succeed, ... one of which is that it requires process orientation. ... That's something that can only be driven by the guy who is above all these functional barons, because none of them wants to give up any autonomy. The other requirement is clout. The person who makes reengineering happen requires a lot of clout because a lot of people need clouting." Hammer's comments reinforce his belief that management support is highly influential on the outcome of reengineering initiatives and that a leader can engender support for a project through the sheer force of their passion or belief.

Organisational Readiness

Hammer and Stanton's (1995) second pre-embarkation factor for reengineering success is *Organizational Readiness*. Nine questions in their self-assessment diagnostic assess aspects of organizational readiness such as the existence in the organisation of an open attitude toward reengineering, the capability to make the changes needed and the resources required to support the process. Reengineering entails radical change and as such "a fair amount of anxiety usually surfaces when a reengineering project is announced" (Manganelli and Raspa, 1995). Much of the reengineering literature focuses on the need to manage change and foster a positive attitude toward the change throughout the organisation. One of the methods suggested for mitigating the resistance to change is the communication of the vision behind the impending change. It is suggested that the reasons and expectations for the change should be communicated organisation-wide as a way of motivating people and enticing them to commit themselves to the project (Davenport

1993, Grint et al. 1996, Hall et al. 1993). Involving the entire organisation in the change process is a good way to overcome lethargy and resistance within the organisation (Romney 1996). In the Grover et al. (1995) study, change management issues emerged as the set of problems with the most significant negative relationship with project outcome. Reengineering is no different from other major projects and as such planning is imperative. Grover et al. (1995) focus on the importance of project planning on the outcome of reengineering projects and focus on the reengineering team and the resources and authority that are placed at its disposal. The quality of resources and the amount of authority given to the project team indicate to the rest of the organisation the level of importance and management support the project is receiving. The resources that reengineering teams require include human (i.e., having the most highly skilled and knowledgeable people); financial (e.g., money for new IT or other expenses); training for team members; and, in some cases, a consultant to provide expert advice (Hammer & Champy 1994, Hammer & Stanton 1995, Keen 1995, Miles et al. 1995).

Style of Implementation

Hammer and Stanton's (1995) third pre-embarkation factor for reengineering success is *Style of Implementation.* The last five questions in their self-assessment diagnostic assess aspects of style of implementation, such as the need for the reengineering project to be scoped correctly, for project participants to be empowered to make changes and management systems to be put into place before the implementation of reengineering projects. The literature reinforces the need to aim redesign efforts at key processes with Hall (1993) noting that often processes for reengineering are "too narrowly defined and therefore have little discernible impact on overall performance". The scope of the process chosen for redesign must be broadly defined in terms of cost improvements or increases in customer value for it to improve performance across the organisation. Redesign projects can also be defined too radically with changes being too wide for organisations to cope with (Davenport 1993, Martinez 1995). Process delineation should be undertaken carefully after having assessed the organisations resources and it should involve the identification of performance improvement goals for the redesigned process (Clemons 1995, Miles et al. 1995). Grover et al. (1995) argued that while process delineation problems may not be difficult to address they have a significant impact on project outcomes.

Management systems such as incentive and reward structures, new skills training, and other human resource policies require alteration in response to the organisational restructuring. It is important that these changes are made before the organisation is restructured if management wish to cultivate the required values towards the reengineering project.

Hammer and Stanton (1995) present their book *The Reengineering Revolution* as a handbook for BPR implementation. The diagnostic consisting of a twenty-question checklist, along the three dimensions discussed above, is meant to indicate "the minimum numbers we believe an organisation should score before tackling reengineering- that is, prior to launching the effort" (Hammer and Stanton, 1995). They argue that high scores on these three categories of questions prior to embarking on a reengineering project "characterise an organisation that is well positioned for successful reengineering" (Hammer and Stanton, 1995).

The results of this review suggest that much of the work toward smoothly implementing reengineering projects could be effected before they are begun. To test the propositions of Hammer and Stanton (1995) and the effect of the organisational context prior to implementation on eventual outcome of projects, data were gathered using a mail questionnaire. The instrument development, its recipients and distribution are discussed in the next section.

METHODOLOGY

A quantitative research design was chosen to examine the importance of the organisational context prior to reengineering on the perceived success of projects. A questionnaire was used in order to facilitate collection of information from a large and geographically disperse sample. The questionnaire was pre-tested on a group of colleagues who understood the hypotheses to be tested and the proposed audience as suggested by Dillman (1978). This section describes the measures used, sampling method, and analysis methods employed.

Measurement

Hammer and Stanton (1995) make it clear that their diagnostic is designed to assess organisational readiness for reengineering, but it is not clear who should complete the diagnostic. So we decided to survey both senior managers and project leaders. Senior managers were asked to give opinions based on their experience of reengineering exercises in the *organisation as a whole.* Project leaders were asked to consider *a single reengineering* project they had worked on. Since we wished to compare organizational readiness before the engineering project to success after, we asked respondents who had completed reengineering projects to try to recall the state of organizational readiness before the project commenced.

Many of the 20 questions from Hammer and Stanton (1995) contained compound questions covering very different concepts. For example question 1 asks whether: "The leader of reengineering is a senior executive who is strongly committed to reengineering and who possesses the title and authority necessary to institute fundamental change". For our questionnaire, we split this question in two to become Q.1: "The reengineering leader possessed the title and authority necessary to institute fundamental change", and Q.31: "The leader of reengineering was a senior executive who

was strongly committed to reengineering" on our questionnaire. (see Appendix A). Respondents were instructed to "indicate the extent to which the conditions prevailed in the organisation PRIOR to the implementation of reengineering" on a five point Likert scale. The Likert scale was anchored at 1 by "strongly agree", at 3 by "neither agree nor disagree", and at 5 by "strongly agree".
The primary dependent variable adopted for our study was *Perceived Success*. *Perceived Success*, measured by one five-point scale question, is according to DeLone and McLean (1992) the most widely used measure of MIS success. A *Cost Reduction* success measure was also used for estimating the success of the individual projects considered by the Project Leader.

Sample

A nation-wide mail survey of Australian organisations was conducted. The questionnaire was distributed to senior managers of the 1000 top Australian companies (chosen on the basis of revenue) in the private or public sectors via a mailing list purchased from Drake List Management Services. The questionnaire package contained a cover letter addressed to the Senior Manager asking him/her to pass the enclosed questionnaire on to a project leader of a recent reengineering project. Both the Senior Manager and the Project Leader were offered a report of the findings of the study in an attempt to motivate them to respond. To increase the response rate, a reminder letter was sent to Senior Managers of non-responding organisations about three weeks after mailing the questionnaire package.
Of the 1000 surveys sent, 196 people indicated that they had not undertaken reengineering (an option we provided in the covering letter) and 155 organisations returned a completed questionnaire. Therefore, our response rate was 35.1 percent. We had responses from 88 pairs of respondents from the same organisation, 49 responses from Senior Managers in an organisation only, and 18 responses from Project Leaders only.
The potential for non-response bias was addressed by profiling both early and late responders and comparing the two groups according to techniques described by Fowler (1993). This analysis yielded no significant differences between the groups and supports the position that non-response bias did not appear to be a problem.
Respondents were from both the public and private sector and came from a mixture of industries. 16.8% responded that they were employed in financial services, 14.6% in manufacturing, 8.7% in government, 7.3% in utilities, 5.1% in mining, 4.4% in IT (including professional services) and 4.3% in health. The average annual revenue of the reporting organisations was $1.58 million and the average number of people employed was 6568.
Responding Senior Managers reported their organisations had initiated an average of 10.4 reengineering projects. Cost reduction was the most commonly cited goal with 69 percent of respondents considering this as a very important factor in the decision to reengineer. Worker productivity increase was the second most commonly cited trigger (46 percent), customer satisfaction level increase was third (45 percent), fourth was cycle time reductions (36 percent) and fifth was defects reduction (24 percent). *Perceived Success* of reengineering projects, from the Senior Managers' point of view is shown in Figure 1(a). Success rates were surprisingly high, given the frequency with which reengineering project failures have been reported in the literature.
Responding Project Leaders had been employed with the current organisation for 10.2 years and reported having an average of 5 years and 4.37 projects worth of experience with reengineering. Reengineering training had been received by only 31 percent of the Project Leaders. The business areas that were the focus of reengineering consisted of a single business division in 29.5 percent of cases, two or more divisions in 33.3 percent of cases, and organisation-wide in 37.2 percent of cases. Reengineering teams consisted of an average of 16 members and consultants were used in 63.5 percent of the reported projects. The consultant input into the reengineering exercise was generally regarded as valuable although it did not correlate with the *Perceived Success* of projects. *Perceived Success* of reengineering projects from the Project Leaders' point of view is shown in Figure 1(b). Again these projects were remarkably successful.

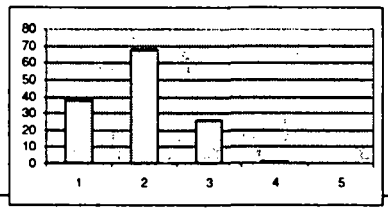
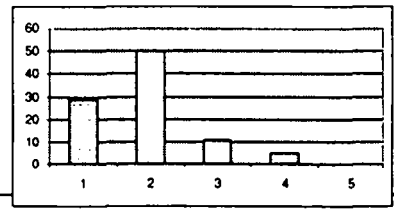
Senior Manager: Perceived Success of Reengineering Projects (n=133)		Project Leader: Perceived Success of Reengineering Projects (n=95)	
Mean: 1.9 S.Dev: 0.71 Number of firms scoring 1 or 2 = 106		Mean: 2.00 S.Dev: 0.87 Number of firms scoring 1 or 2 = 79	

Figure 1: Perceived success of reengineering projects, from (a) Senior Managers and (b) Project Leaders. (1 = Success, 3=Neither a success or failure, 5 = Failure. No projects were classified as failures.)

For both Senior Managers and Project Leaders the questions about *Reengineering Leadership* seemed to elicit the most responses in strong agreement to indicate that a strong, positive leadership existed before reengineering was embarked upon. *Organisational Readiness* and *Style of Implementation* questions were more often answered with neither agreement nor disagreement.

RESULTS

Recall that our research question is as follows: *Does the diagnostic proposed by Hammer and Stanton really predict whether organisations are well positioned for reengineering success?* We answered this question by (a) computing scores as suggested by Hammer and Stanton and comparing them to *Perceived Success*, (b) examining correlations between Hammer and Stanton's three factors and *Perceived Success*, and (c) using linear regression to examine relationships between Hammer and Stanton's factors and *Perceived Success*. We also examined the factor structure of Hammer and Stanton's instrument to see if the factor structure predicted by Hammer and Stanton could be confirmed empirically.

First, scores for the twenty questions proposed by Hammer and Stanton (1995) were reconstructed by summing and averaging the answers to the 31 component questions asked in our questionnaire (see Appendix A). Scores for the first six questions were then summed to calculate a score for *Reengineering Leadership*, the next nine questions for the score on *Organizational Readiness*, and the last five questions for the score on *Style of Implementation*.

According to Hammer and Stanton (1995), Theme scores should exceed 24, 28, and 18, respectively, with the total exceeding 75 if the firm is ready to proceed with reengineering. Table 2 shows percentages of senior manager and project leader scores for the three "themes" and overall. The last row of Table 2 shows the proportion of projects classified as successes.

Variable	Maximum possible	Recommended Threshold score before proceeding	Percentage of Senior managers scoring their organization above min.	Percentage of Project leaders scoring their organization above min..
Reengineering Leadership	6*5=30	24	39.7	42.2
Organizational Readiness	9*5=45	28	75.7	53.9
Style of Implementation	5*5=25	18	71.3	48.0
Overall Score	20*5=100	75	55.1	25.5
Perceived Success of subsequent reengineering project(s)			106 of 133 cases (80%)	79 of 95 cases (83%)

Table 2: Percentages of Factor and Overall scores exceeding for the Hammer and Stanton (1995: 86-90) thresholds, plus perceived project success

Using *Overall Scores* as the criterion, it would seem that for the projects our respondents classified as reengineering, Hammer and Stanton have set their threshold scores too high. Only 55.1% of senior manager evaluations passed Hammer and Stanton's threshold score, yet about 80% of projects were later judged to be successes. (Alternative explanations are (a) that the projects our respondents described as reeengineering were not really reengineering, i.e., perhaps they involved less radical change, or (b) that despite being insufficiently prepared, the organization took steps later to overcome its problems, and so succeeded.) The corresponding figures for project leaders were 25.5% and 83%, respectively.

Second, even if Hammer and Stanton have set their threshold scores too high, it seems likely that higher readiness scores would lead to more successful projects. Pearson correlations between the four independent variables (above the solid line in Table 2) and *Perceived Success* (below the line) are shown in Table 3. Correlations with *Perceived Success* were much lower than correlations between the readiness indicators. For senior managers, correlations between the three readiness factors and eventual project success were significantly correlated ($p<0.001$). For project managers, the only significant correlation was between Organizational Readiness and Project Success ($p<0.001$). In addition, for the 88 cases where we had responses from senior managers and project managers in the same organization, we ran correlations between their scores for the three Theme variables. As shown in the left of Figure 2 (the curved arcs), all three pairs of variables were significantly correlated.

	Senior Managers				Project Leaders				
	Leader-ship	Org. readiness	Style	Overall score	Leader-ship	Org. readiness	Style	Overall score	Perceived Success
Leadership	1.000	.665	.829	.901	1.000	.543	.754	.874	
Org. readiness	.665	1.000	.725	.900	.543	1.000	.580	.853	See
Style	.829	.725	1.000	.923	.754	.580	1.000	.864	Below
Overall score	.901	.900	.923	1.000	.874	.853	.864	1.000	
Perceived Success	-.283 p=0.001	-.279 p=0.001	-.339 p=0.001	-.328 p=0.001	-.076 n.s.	-.235 p=0.022	-.109 n.s.	-.173 p=0.094	
Cost reduction					.030 n.s.	.097 n.s.	-.016 n.s.	.057 n.s.	-.212 p=0.066

All correlations between the four readiness variables significant at the 0.001 level (2-tailed). n.s. means not significant, n.a. means not available. Correlations with success are negative because *Perceived Success* was scored 1 for greatest success.

Table 3: Correlation between the three themes, overall readiness score, and perceived success

Third, we used linear regression to see how much variance in the *Perceived Success* variable was explained by the three Theme measures after controlling for the effect of the other factors. Path coefficients (standardized beta) are also shown in Figure 2. Coefficients of determination (adjusted R-square) for these regressions were poor: 0.097 (n=132) for senior managers, and 0.028 (n=95) for project leaders. Evidently, Hammer and Stanton's diagnostic variables, although significantly correlated with *Perceived Success*, are not good predictors of reengineering project success.

Finally, we factor analysed the 31 questions used in the questionnaire (Appendix A) to see if Hammer and Stanton's intuitive grouping of questions could be replicated empirically. For meaningful factor analysis it is desirable to have some hundreds of responses and at least five cases for each variable (Tabachnick and Fidell, 1989). Since senior managers and project leaders had both answered the same 31 questions, we were able to combine responses from the two datasets to give a sample size of 234 respondents (88 pairs from the same organization).

Finally, results from Principal components analysis with Varimax rotation are shown in Appendix B. Although six eigenvalues were greater than one, the scree plot suggested no more than four distinct factors, so we report the four-factor solution here (see Appendix B). Possible names for the first three factors are, in order, Reengineering Leadership, Management Commitment, and Organizational Readiness. In other words, two of Hammer and Stanton's expected three factors emerged from the factor analysis, but questions that measured Hammer and Stanton's *Organizational Readiness* factor split into two factors that we called Management Commitment and Organizational Readiness. Their *Style of Implementation* factor did not emerge clearly from the analysis. Correlation and regression analysis showed that the new factors were not any better correlated with *Perceived Success* than Hammer and Stanton's factors.

Limitations of the study

As with all research, our work has a number of limitations. In our questionnaire, respondents were required to cast their minds back in time in order to answer many of the questions. The ability of the respondents to recall past events could potentially lead to errors. Our study also relied on respondent perceptions. Using a survey and perceptual measures is problematic because it introduces the potential for bias; however, for this research a mail survey was the most effective way to reach a large number of geographically dispersed respondents.

A second weakness is that with the *Organisational Readiness* questions the respondent was required to answer on behalf of the organisation. The potential for bias exists because a single individual is required to make assumptions on behalf of the organisation. We considered that the combination of both Senior Managers and Project Leaders recollection and opinion would help overcome these potential weaknesses. As the opinions of Senior Managers and Project Leaders were significantly correlated we hope believe bias is not too strong.

A third limitation of this research is the lack of a sample of organisations that consider their reengineering exercises unsuccessful. We asked respondents to consider any reengineering project their organisation had undertaken and it seems there could be a degree of self-selection bias as no projects were reported as unsuccessful.

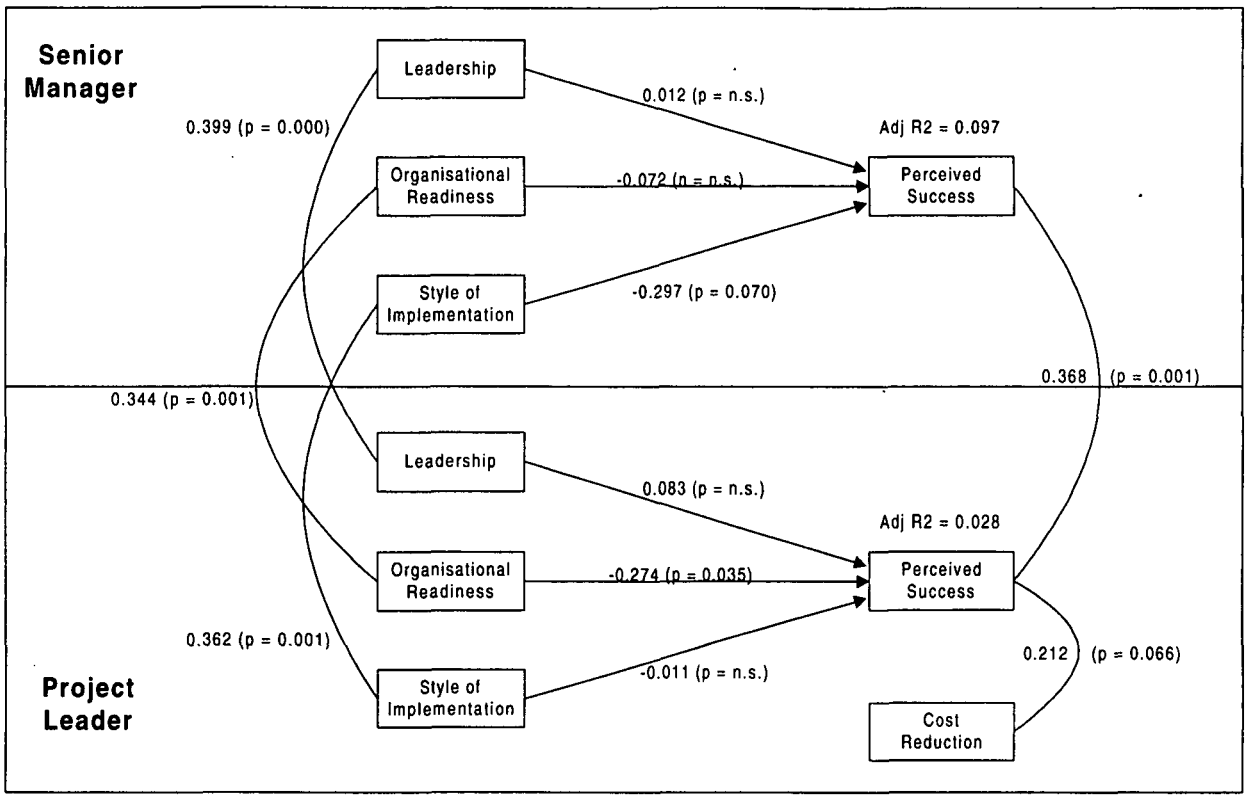


Figure 2: Regression analysis of Theme and Success variables for both senior managers and project leaders, with correlations between the 88 pairs of senior managers and project leaders from the same organisation.

CONCLUSIONS

The reengineering literature stresses the importance of change management in projects and Hammer and Stanton (1995) contend that organisations should be made ready for change prior to embarking on a reengineering project. This contention is supported by the results of our study, although not strongly. Variance in the three independent readiness variables explained little variance in the dependent variable, Perceived Success (regression analysis). In addition, three of the eight correlations with perceived success were not significant.

This investigation was done in conjunction with research into critical success factors for implementation of reengineering projects based on the work of Grover et al. (1995) (see Table 1). The same Project Leaders who responded in the Hammer and Stanton (1995) study were asked to consider the severity of certain problems encountered during implementation of the reengineering project. The results of the Grover et al. replication stressed the importance of change management, management support, project management, and planning, during the implementation of reengineering projects, with these factors correlating significantly with *Perceived Success* (Murphy and Staples, 1998). Many of the questions asked and factors measured by Murphy and Staples were similar in content to those asked by the Hammer and Stanton (1995). This seems to indicate that the impact of the environment prior to reengineering, although important, is less so than the environment and conduct during implementation. Hammer and Stanton (1995) acknowledge that this is the case with their statement about the diagnostic: "These minimum scores, as we said are what you need before you start. Once implementation is under way, however, the required minimum scores go up – sometimes way up. ... As implementation progresses, intensity increases – meaning that leadership, resources and focus, already strong must get stronger. So don't just take this test once and forget it, use it again and again."

In order to understand why Hammer and Stanton's (1995) factors did not correlate strongly with success we compared their factors with those used in the Murphy and Staples (1998) replication of Grover et al. (1995). It was interesting to note the difference between Hammer and Stanton's (1995) *Reengineering Leadership* construct and Grover et al.'s (1995) Management Support construct. The Grover et al. (1995) construct focuses on a management team leading the reengineering project, in contrast the Hammer and Stanton (1995) construct considers a single "reengineering leader". This observation leads us to question the idea, popularised in practitioner literature, of a strong leader single-handedly wielding his or her influence over an organisation in the throes of change. Hammer and Stanton's (1995) *Organisational Readiness* and *Style of Implementation* constructs range across the Grover et al. (1995) factors of project planning, process delineation and change management rather than being two distinct constructs as defined in the diagnostic.

Although we consider the diagnostic an important tool for raising awareness in practitioners of issues surrounding implementation of change programs, our analysis raises some question about its rigor. The compound nature of questions and the lack of evidence that they measure the three underlying factors expected by Hammer and Stanton (1995) lead us to question its use as a prescriptive diagnostic. We suggest that practitioners use it as a guide or

descriptive indicator of issues to be managed rather than as a universal yardstick of readiness.
Finally, although the Hammer and Stanton (1995) diagnostic focuses on reengineering we suspect its lessons are equally valid for other major programs of change. The diagnostic, while not completely validated by this study, can be used to heighten management's appreciation of the important factors to consider when embarking on any major program of change.

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APPENDIX A

Qu	Questionnaire Statement	H&S Theme & Qu.
1.	The reengineering leader possessed the title and authority necessary to institute fundamental change	RL 1
2.	The organisation placed a high value on serving customers	OR 15
3.	The organisations experience with total quality management (TQM) had created an environment that was receptive to reengineering	OR 14
4.	Managers were motivated to assure that the processes were successfully reengineered	SI 19
5.	The organisation believed that the commitment of the senior management team would be long-lasting	OR 9
6.	Key staff organisations – human resources, finance, and information systems - were positive about the prospect of reengineering	OR 13
7.	The organisation believed that the reengineering leader was truly committed to reengineering	OR 9
8.	The organisation had none of the complacency and arrogance that often follow a sustained period of success	OR 10
9.	The organisation believed that the senior management team were truly committed to reengineering	OR 9
10	The reengineering leader had a vision of the kind of organisation he or she wished to create	RL 3
11	The organisation understood the nature of reengineering, including the fact that it results in multidimensional change that impacts processes, jobs, organisational structure, management responsibilities, etc.	OR 8
12	The reengineering effort was directed at key business processes rather than organisational units	SI 18
13	The organisation believed that the reengineering leaders commitment would be long-lasting	OR 9
14	The reengineering leader truly understood the nature of reengineering	RL 2
15	The organisation had a solid understanding of customer needs	OR 15
16	The organisation had the human resources needed to implement reengineering	OR 12
17	The reengineering leader was able to express the vision he or she had for the organisation clearly and simply in operational terms	RL 3
18	The organisation as a whole recognised the need for reengineering and fundamental change	OR 7
19	The organisation was comfortable with the way in which reengineering proceeds, through risk taking, learning, and ambiguity	SI 16
20	The reengineering leader was ready and able to exercise leadership - through communications, personal behaviour, and systems of measurement and reward - in order to make reengineering succeed	RL 4
21	The entire senior management team shared the leaders enthusiasm for reengineering	RL 6
22	Measurement systems and performance goals were established to chart the progress of reengineering	SI 20
23	Key staff organisations – human resources, finance, and information systems - were capable of innovative responses to reengineering's demands	OR 13
24	The organisation was free of the scepticism, mistrust, and ambivalence that often follows a period of downsizing or restructuring	OR 11
25	The reengineering leader was prepared to commit the organisational resources that reengineering required	RL 5
26	The organisation had the financial resources needed to implement reengineering	OR 12
27	The members of reengineering teams felt empowered to 'break the rules' and to challenge long-standing assumptions	SI 17
28	The reengineering leader was prepared to commit the personal attention that reengineering required	RL 5
29	The reengineering leader understood the magnitude of the change reengineering entailed	RL 2
30	Managers were given end-to-end responsibility for the processes to be reengineered	SI 19
31	The leader of reengineering was a senior executive who was strongly committed to reengineering	RL 1

APPENDIX B

Rotated Component Matrix for 31-Question Factor Analysis (N = 234)

	1	2	3	4
QU 28	.833			
QU 29	.752			
QU 25	.736			
QU 20	.729			
QU 17	.726			
QU 31	.709			
QU 30	.685			
QU 27	.676			
QU 10	.650			
QU 14	.564			.538
QU 7	.539	.530		
QU 22	.491			
QU 13	.482			.408
QU 11				
QU 26				
QU 9		.762		
QU 4		.738		
QU 6		.734		
QU 5		.703		
QU 1	.461	.533		
QU 2		.501		.470
QU 24			.651	
QU 23			.651	
QU 16			.623	
QU 19			.612	
QU 18			.513	
QU 21		.434	.461	
QU 15		.422	.426	
QU 12				.656
QU 3				
QU 8				

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a Rotation converged in 8 iterations.	Factor 1: Reengineering leadership Factor 2: Management commitment Factor 3: Organizational readiness Factor 4: unnamed