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Measuring the impact of risk factors associated with project success criteria in early phase.

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Abstract

A survey was conducted in order to collect empirical data about the frequency of occurrence of several risk factors associated with success criteria. On the basis of the statistical correlation we may conclude that there are four risk factors in the initiation phase that, if occurring, will lead to the occurrence of risk factors in the implementation and evaluation phase. These risk factors are; 1) Failing to identify all success criteria due to lack of knowledge about stakeholders, 2) Having conflicting or competing criteria in order to accommodate the multiplicity and diversity of stakeholders, 3) Use of optimistic or pessimistic targets in the formulation of success criteria, 4) Use of ambiguous/soft criteria that might be interpreted differently. These factors affect all aspects of management and evaluation. The presence of these factors is also found to be contribute to the occurrence of other factors such as 1) lack of organizational commitment, and top management support 2) poor alignment to success criteria in the performing organization, 3) Subjective assessment of the project outcome during evaluation phase.

Project success; success criteria; success factors

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1. Introduction

In a recent paper, Hussein (2013) identified six key risk factors that influence the quality of project success criteria in the initiation and planning phase. These risk factors, if not accurately identified and mitigated at the start of the initiation phase, will lead to further complications in the execution and evaluation phases of the project. These factors are:

1.1. The narrowness of the criteria

This risk factor is related to selection of success criteria that focuses only on the project management effort and do not include success criteria that describe the expected benefits and gains of the project to stakeholders. Project management literature makes distinction between project/product success and project management success (Baccarini 1999, Lim and Mohamed 1999). Project success embodies the perceived value of a project when the result or product is in operation. Project management success, on the other hand, is considered the ability to comply with time, cost, and scope requirements and is concerned with the efficiency of the project organization (Atkinson 1999). Project management success is therefore described as a narrow view of success (Westerveld 2003). Narrow focus therefore refers to selecting a limited set of criteria that measures the achievement of project management success.

1.2. Ambiguity

Ambiguity refers to the formulation of success criteria which may be differently interpreted (Duimering, Ran et al. 2006). Ambiguous criteria are also known as soft or subjective criteria (Crawford and Pollack 2004). Hussein (2012) gives several examples of ambiguous criteria including user satisfaction, the quality of being intuitive in use, user friendliness, ease of use, and safety. This category of criteria is hard to measure and therefore control. Time taken to clarify and understand the criteria may subject them to new interpretation and therefore to change project priorities, and might lead to improper allocation of resources or to misunderstandings in the performing organization.

1.3. Diversity

The presence of competing and conflicting criteria due to the diversity of a stakeholder's interest, power and influence is another risk factor that complicates the selection of success criteria. Diversity reflects the degree of variation among stakeholders or within the project scope (Hussein 2012). The diversity of stakeholders may involve geographical locations, national cultures, working practices, awareness of objectives (goal misperception), and the variety of skills or disciplines that are used in a project. The challenge that faces projects is how to accommodate the diverse, and even contradictory, expectations of all the stakeholders. Contradictory expectations give rise to complicated situations that require effective decision-making (Maylor, Vidgen et al. 2008, Hussein 2012)

1.4. Incompleteness

An additional factor that complicates the definition of project success criteria is uncertainty, or a lack of full knowledge about the range of project stakeholders at start-up (Young 2006), or lack of knowledge about the full range of use of the product or system. This is part of the fundamental uncertainty that characterizes project management (Atkinson, Crawford et al. 2006). The consequences of this uncertainty or lack of knowledge about stakeholders or operational use of the product might result in having incomplete sett of project success criteria. This might lead to improper allocation of resources, conflicts or to misunderstandings in both the sponsor and the performing organizations.

1.5. Unrealistic targets

Something that leads to the imperfect definition of success criteria is the (blown optimistic or pessimistic) expectation regarding the target of, for example, time, cost, or expected benefits (Chapman, Ward et al. 2006). This may lead stakeholders to perceive a project that was in fact successful in achieving near-optimal results as a partial failure. How success is defined and who evaluates success therefore affects the final judgment of success and failure (Smithson and Hirschheim 1998). One respondent from the survey conducted in this paper exemplified this factor and reported that the success criteria in their project were defined or channelled to the project by the sponsor who initiated the project and these criteria are not grounded in an actual understanding of project complexity, scope, resource needs, learning needs, or dependency on other stakeholders or other running projects.

"*Directives in my company state that all projects should be completed within six months, and this is the only criteria used to evaluate projects"*

1.6. Lack of ranking

This risk factor arise when the sponsor or organization fail to identify the relative importance of each success criteria. That is all the criteria are considered to have the same importance (Young 2001). This lack of ranking among the criteria might complicate decision making on a later stage. It also complicates the evaluation of the final outcome of the project.

2. Research objectives

We have summarized the risk factors associated with project success criteria in in the initiation/planning phase in table 1. The table shows

Table 1. Summary of risk factors in the initiation /planning phase

Risk factor	Meaning
Unrealistic	Use of optimistic or pessimistic targets in the formulation of success criteria.
Ambiguous	Use of ambiguous/soft criteria that might be interpreted differently
Narrow	Success criteria contain a limited set of criteria that focuses only on project management effort.
Diverse	Having conflicting or competing criteria in order to accommodate the multiplicity and diversity of stakeholders.
Alike	Lack of order or rating of each success criteria. That is all criteria are considered equally important
Incomplete	Failing to identify all success criteria due to lack of knowledge about stakeholders

The aim of this study is to examine and analyse the correlations between the risk factors shown in table 1 and other risk factors that usually arise during execution and evaluation phase. In particular, the study is aiming to investigate the correlation between the above-mentioned risk factors in the initiation phase and the following risk factors:

1. Lack of organizational commitment and top management support to the achievement of project success criteria during project execution
2. Lack of alignment in the performing organization to project success criteria during execution phase
3. Subjectivity of measuring the achievement of the targeted success criteria at close out and evaluation phase.

2.1. Lack of organizational commitment to project success criteria in the execution phase.

According to Thomas and Fernández (2008) companies who used the criteria effectively during execution phase were willing to re-direct project resources based on an *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. This implies that defining proper success criteria or clusters are simply not enough to achieve excellence in project management (Hartman 2000). Proper measures in terms of strategies, rules, resources, and metrics should accompany these success clusters as well. For instance, achieving the long term and wider benefit requires strong involvement of the sponsor or the project owner as disclosed by Munns and Bjeirmi (1996).

2.2. Lack of alignment in the performing to project success criteria.

A lack of alignment to project success criteria in the performing organization is another risk factor that might complicate project management. Thomas and Fernández (2008) found that companies with high levels of confidence in their IT projects have used the intermediate results actively in managing projects. This included; 1) the management of the project according to the agreed definition of success, 2) a willingness to stop projects, 3) accountability for results, 4) and a connection to learning. They further found that 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 politically motivated misrepresentations.

Couillard (1995) demonstrated through a field study the correlation between an understanding of *project objectives* and effective project risk management. Hussein (2012) provided several examples of how poor alignment impacts outcome. In the IT industry for instance, achieving customer satisfaction in projects is an important success criterion in every project. Nonetheless, this objective usually does not materialize into tangible measure such as defining the scope of involvement or defining approval routines by the customer. Late changes and adjustments are introduced in order to adapt the product to expectations in order to ensure customer satisfaction. These changes had a significant negative impact on other objectives; forcing the project organization to give lower priority to other success criteria such as completion on time and within budget.

2.3. The subjectivity of measurements in the evaluation phase of the project.

Making a verdict regarding success or failure may not be unanimous among project stakeholders. Rad (2002) Attributes the reason for these different verdicts is that people subtly modify the interpretation of quantitative indices of project performance. These issues include items such as trust, team spirit, morale, responsiveness, punctuality, customer focus, communications, teamwork, conflict resolution, trust, integrity, honesty, sociability, and flexibility. The use of symbolic and rhetoric evaluation of project success and failure was therefore suggested by (Ika 2009).

3. Method

For this study, a web-based survey was devised and sent to around 800 respondents worldwide. The survey can be viewed at (Hussein 2013). The survey was anonymous, but respondents had the opportunity to leave their contact information if they were willing to discuss the results of the survey with the author. Seventy-nine respondents returned valid responses and six respondents have expressed willingness to take part in in-depth interviews. In this paper we mainly focus on the results obtained by the web survey. Descriptive and analytical statistics will be used to interpret the results.

3.1. Reliability of the responses

Cronbach's alpha measures how well a set of variables measures a single one-dimensional latent construct. A reliability coefficient of .70 or higher is considered "acceptable" in most social science research situations. The reliability test for the questionnaires gave a coefficient of 0.833 suggesting high reliability.

3.2. Survey

Respondents were asked to recall their last project, or a project that they have thorough knowledge about, and

answer several questions. In this paper we present the results obtained from two questions.

Q1. Respondents were asked to select, on a scale from 1 to 5, the degree to which they believed each of the risk factors shown in Table 2 was encountered in the project where 1 means rarely and 5 means frequently.

Table 2 Risk factors in the survey

Unrealistic
Ambiguous
Narrow
Diverse
Alike
Incomplete
Lack of top management support
Lack of alignment in the performing organization
Subjectivity of measurement

The survey therefore collected information about the observed occurrence of the problems and not about the respondent's opinion of the problem itself.

4. Findings

4.1. Statistical correlations

The collected data was examined for statistical correlations between the risk factors associated with project success criteria in the initiation phase. The significant correlations are marked in bold red color in table 3.

The results obtained show for instance, that in the initiation/planning phase basing the project on an incomplete set of project success criteria due to lack of knowledge about important stakeholders is statistically correlated with several risk factors including having ambiguous/soft criteria, having narrow set of criteria, and lack of ranking among success criteria. The results also suggest that proper mitigation of defining incomplete set of success criteria will also reduce the occurrence of the other risk factors. Measures such as early involvement, stakeholder's analysis, communication and approval routines should contribute to resolving this risk factor.

The table also shows that the risk of having competing and conflicting criteria is correlated with using subjective/soft formulation of criteria. We have asked one of the respondents who contributed to the survey to explain this statistical correlation from his point of view as a project practitioner and the informant confirmed that that using ambiguous formulation of project success criteria seems to be an approach used to deal with having diverse number of stakeholders with different expectations and goals of the project.

"We are trying to keep everybody happy by having vague formulation of criteria"

This correlation might be interpreted as if using ambiguous criteria is used as away out to deal with the competing and conflicting expectations of stakeholders. Keeping every body pleased by formulating vague and unclear criteria.

The collected data was also examined for statistical correlations between the risk factors in the execution and evaluation phase and the risk factors associated with project success criteria in the initiation phase. The significant correlations are marked in bold red color in Table 4.

The results obtained show for instance, that lack of organizational and top management support is statistically correlated with three risk factors from the initiation phase, 1) using ambiguous/soft criteria, 2) using conflicting or competing criteria due to diversity, and 3) basing the project on an incomplete success criteria.

On the other hand, lack of alignment in the performing organization is statistically correlated with 1) basing the project on unrealistic criteria, 2) using ambiguous criteria, 3) having competing and conflicting criteria, 4) lack of

ranking and 5) having incomplete set of criteria. This result may in fact suggest that almost all risk factors that might occur in the initiation phase if not addressed and mitigated will impact the alignment in the performing organization. The results also show that subjectivity of measurements is statistically correlated to 1) basing the project on an incomplete set of project success criteria and 2) having ambiguous/soft criteria,

Table 3 Correlation test between risk factors in the initiation phase

Risk factor	Correlation/significance	Unrealistic	Ambiguous	Narrow	Diverse	Alike	Incomplete
Unrealistic	Pearson Correlation	1					
	Sig. (2-tailed)						
Ambiguous	Pearson Correlation	-0.105	1				
	Sig. (2-tailed)	0.357					
Narrow	Pearson Correlation	0.121	0.077	1			
	Sig. (2-tailed)	0.289	0.502				
Diverse	Pearson Correlation	0.054	**.382****	0.05	1		
	Sig. (2-tailed)	0.634	0.001	0.664			
Alike	Pearson Correlation	0.198	0.16	.230*	0.084	1	
	Sig. (2-tailed)	0.08	0.159	0.042	0.463		
Incomplete	Pearson Correlation	.250*	**.333****	**.298****	0.212	**.376****	1
	Sig. (2-tailed)	0.026	0.003	0.008	0.061	0.001	

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).

Table 4 Correlation test between risk factors in the survey

Risk factor in the initiation phase		Lack of organizational and top management support.	Lack of alignment in the performing organization	Subjectivity of measuring the final outcome of the project
Unrealistic	Pearson Correlation	.240*	**.346****	-0.022
	Sig. (2-tailed)	0.033	**0.002**	0.845
Ambiguous	Pearson Correlation	**.402****	**.340****	**.466****
	Sig. (2-tailed)	**0**	**0.002**	**0**
Narrow	Pearson Correlation	0.109	0.089	0.104
	Sig. (2-tailed)	0.337	0.437	0.362
Diverse	Pearson Correlation	**.400****	**.439****	.268*
	Sig. (2-tailed)	**0**	**0**	0.017
Alike	Pearson Correlation	.245*	**.289****	0.181
	Sig. (2-tailed)	0.029	**0.01**	0.111
Incomplete	Pearson Correlation	**.567****	**.353****	**.404****
	Sig. (2-tailed)	**0**	**0.001**	**0**

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).

4.2. Linear regression

In order to investigate the most important correlations between the risk factors in the initiation phase and the risk factors in the execution and evaluation phase a multiple linear regression test was conducted using SPSS. In this test the risk factors in the initiations phase were used as the independent variables and each of the risk factors

in the execution and evaluation phase was used as the dependent variable. A summary of the results from the multiple regression tests for each the dependent risk factor is shown in Table 5. The results shows for instance that that there are three risk factors that if not addressed will lead to reduced alignment in the performing organization. These risks are:

1) Use of optimistic or pessimistic targets in the formulation of success criteria.
2) Having conflicting or competing criteria in order to accommodate the multiplicity and diversity of stakeholders.
3) Use of ambiguous/soft criteria that might be interpreted differently

Table 5 Summary of multiple regression test

Factor	Most important predictors (importance)
Lack of organizational commitment	Incomplete (0.61)
	Diverse (0.19)
Alignment in the performing organization	Unrealistic (0.38)
	Diverse (0.35)
	Ambiguous (0,17)
Subjective assessment	Ambiguous (0.57)
	Incomplete (0.3)

The results also show that organizational commitment and top management support will be reduced mainly as a result of failing to identify all success criteria due to lack of knowledge about stakeholders. An additional risk factor that contribute also to reduced organizational commitment but to l a lesser degree is having conflicting or competing criteria in order to accommodate the multiplicity and diversity of stakeholders. Results may therefore suggest that reducing the occurrence of these factors or reducing their impact should also help to enhance top management support and gain better commitment from top management.

In the evaluation phase, subjectivity of evaluation could be attributed to two factors from the initiation phase: the use of ambiguous criteria and Failing to identify all success criteria due to lack of knowledge about stakeholders. The higher the use of ambiguous and incomplete criteria, the more likely that measurement will also be based on subjective assessment.

5. Conclusions

The goal of this paper was to conduct an empirical investigation to examine the correlation between several risk factors that complicate the definition and management of project success criteria. On the basis of a literature review nine different factors were identified. A survey was then conducted in order to collect empirical data about the frequency of occurrence of these factors in real life projects. On the basis of the statistical correlation we may conclude that there are four risk factors in the initiation phase that, if occurring, will lead to the occurrence of risk factors in the implementation and evaluation phase. These risk factors are;

1) Failing to identify all success criteria due to lack of knowledge about stakeholders,
2) Having conflicting or competing criteria in order to accommodate the multiplicity and diversity of stakeholders,
3) Use of optimistic or pessimistic targets in the formulation of success criteria,
4) Use of ambiguous/soft criteria that might be interpreted differently.

Results of the survey also suggest that using ambiguous/soft criteria that might be interpreted differently is significantly correlated with having conflicting or competing criteria in order to accommodate the multiplicity and diversity of stakeholders. Dealing with diversity of stakeholders might therefore reduce the scope of use of ambiguous criteria. Organizational commitment and top management support could be improved by taking

measures to include success criteria that are relevant for each category of stakeholders and concurrently balancing these expectations to avoid competing or conflicting success criteria. Alignment in the performing organization could be improved by avoiding or eliminating the use unrealistic targets, as well as having balanced success criteria with no inherent conflicts or contradictions. Clarity and measurability of success criteria should also help increasing alignment in the performing organization. Better clarity and measurability of success criteria should also help reducing the occurrence of subjective assessment of success criteria.

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