INITIAL IDENTIFICATION AND CATEGORISATION OF CRITICAL SUCCESS FACTORS OF PPP PROCESSES

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Summary

The method of Critical Success Factors (CSFs) is widely adopted as an approach of measuring project performance, including the Public Private Partnership (PPP). Because of the special considerations of different industries, there lacks a consistent set of CSFs in each of the industry matters. This report, as the first step of a systematic study to structure a robust rule break to estimate the process for the establishment of PPPs, aims at producing a heuristic list of CSFs from previous studies and a concise and reasonable way of categorising these CSFs. Based on the identification and categorisation of CSFs from previous studies, potential research processes are also proposed in this report.
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Introduction

Project Performance Measurement
Measurement and forecasting of the performance of a project at an early stage has a great importance to the final outcomes. Sanvido et al. (1992) argues that should a better possibility of predicting project success be achieved, steps can be taken to:

1. Avoid unsuccessful projects;
2. Identify good projects worth pursuing; and
3. Identify problems on current projects and take corrective action.

There have been various performance assessment methods being discussed with advantages and disadvantages identified. For example, Ye and Tiong (2000) proposed a modified Value-at-Risk (VaR) approach for infrastructure project investment evaluation. Woodward (1995) suggested using sensitivity analysis in PPP project evaluation. As a preliminary requirement of adopting these methods, the importance of a list of factors influencing the project success (Ashley, 1987; Tuman, 1986; de Wit, 1986) is gradually realised (Rockart, 1982) and the method of using a list of factors for evaluating projects has since became popular. With such method, project success is clearly defined by the identified factors and the perspectives from which project success is measured are clear, which are considered to be critical for performance assessment by Morris (1983).

The Critical Success Factors Method
The method of Critical Success Factors (CSFs) is widely adopted as an approach of measuring project performance. Initially developed by Rockart (1982), CSFs are defined as

*“those few key areas of activity in which favourable results are absolutely necessary for a particular manager to reach his or her goals”.*

Such approach has since become a prolific research area, which is widely accepted to pursuit of excellence in project delivery systems (Sanvido et al., 1992). A set of properly identified CSFs is of great importance in measuring project performance (Chua et al., 1999), forecasting the probability of success (Sanvido et al., 1992), and ensuring the competitive performance of organisations (Tiong et al., 1992; Tiong and Alum, 1997; Gupta and Narasimham, 1998).

CSFs have been used in different industries, such as:

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3 Build-Own-Operate-Transfer (BOOT) was specifically focused in Woodward’s work.
• Management;
• Manufacturing;
• Construction; and
• PPP

It is therefore considered reasonable to use the CSF approach and tailor it as a means to assess PPP performance.

**Review of Previous Studies**
Because of the special considerations of different industries, there lacks a consistent set of CSFs in each of the industry matters. In the context of PPP, CSFs are specially defined to include “key areas” (Boynton and Zmud, 1984), “drivers of success” (Keene, 1998), Distinctive Winning Elements (DWEs) (Tiong, 1996), and specially factors for risk and resource allocation. Regardless of the different names and the way of categorising them, CSFs in PPP refer to the factors of considerable influence on and closely related to the success of PPP.

**Identification of Critical Success Factors**
CSFs are identified from different resources, such as review and summary of previous studies, questionnaires, and lessons learnt from practices (Li et al., 2005; Zhang, 2005a). Inconsistent identification of CSFs and methods to categorise them between previous studies (Table 1) hampers the development of an appropriate framework of CSFs for PPP performance evaluation, and thus largely compromises the comparability and consistency between conclusions drawn from previous efforts. Table 1 summarises and compares some representative studies of CSFs of PPP to provide a snapshot of such inconsistent studies.

The representative studies summarised in Table 1 comprise of two types of studies of CSFs of PPP, which are CSFs of the entire PPP process and CSFs of tendering process in PPP (Tiong et al., 1992; Tiong and Alum, 1997). The CSFs of tendering process are considered as a subset of what being used for the whole process of PPP. Special focus of tendering process is therefore reflected by the unique CSF—“special feature of bids” (Tiong et al., 1992) and “Differentiation in guarantees” (Tiong and Alum, 1997).
Previous studies suggested different numbers and groups of CSFs. Apart from the different resources used to summarise and group the CSFs, the perspectives from which these studies are carried out lead to the different composition of CSF list.

Table 1. A summary of representative studies of CSFs of PPP

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<td>Review/Case Study</td>
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</table>

These representative references have inconsistent levels of CSFs. Some include a list of sub-CSFs, and group similar ones into CSFs/factors, such as Zhang (2005a; 2005b) and Tiong et al (1992); some have a full list of CSFs and call the group of CSFs with different names, such as “project aspects” (Chua et al., 1999), “risk area” (Fitzgerald, 2008) and time related “phase” (Qiao et al., 2001). What is more, some do not have groups of CSFs at all due to the realisation of the difficulties of grouping (Jefferies et al., 2002; Li et al., 2005). According to the definition of CSFs, we call the factors on the fundamental level of the list CSFs and any higher level items category of CSFs in this report. With this agreement, it is clear that CSFs are factors that can be used directly to assess PPP performance at an applicable level.

Current Groups of Critical Success Factors
Detailed categories listed in Table 2 explores the popular means of grouping CSFs. Except the tendering related categories “Special feature of bids” and “Differentiation in guarantees”, most categories focus on aspects including:

1. Economic and commercial;
2. Project characteristics (including project specific and right project);
3. Financial;
4. Participant (including consortium, stakeholder and public/private sectors);
5. Environmental (including investment environment; social, political and legal environmental; and natural environment);

6. Technical; and

7. Risk and contractual.

Table 2. Categories of CSFs identified from previous studies

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<thead>
<tr>
<th>Category 1</th>
<th>Economic</th>
<th>Project characteristics</th>
<th>Project specific</th>
<th>Entrepreneurship</th>
<th>Technical</th>
<th>Social, political and legal risks</th>
<th>Preliminary</th>
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<tbody>
<tr>
<td>Category 2</td>
<td>Risk allocation and contract</td>
<td>Contract</td>
<td>Economic</td>
<td>Right project</td>
<td>Financial</td>
<td>Economic and commercial conditions</td>
<td>Tendering</td>
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<td>Category 3</td>
<td>Financial</td>
<td>Participants</td>
<td>Political</td>
<td>Strong team of stakeholders</td>
<td>Differentiation in guarantees</td>
<td>Public procurement framework</td>
<td>Concession award</td>
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<td>Category 4</td>
<td>Investment environment</td>
<td>Interactive process</td>
<td>Natural</td>
<td>Technical</td>
<td>Financial</td>
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<td>Construction</td>
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<td>Category 5</td>
<td>Consortium and technical</td>
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<td>Financial</td>
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<td></td>
<td>Public sector issue</td>
<td>Operation</td>
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<tr>
<td>Category 6</td>
<td></td>
<td></td>
<td>Special feature of bids</td>
<td></td>
<td></td>
<td>Private sector issue</td>
<td>Transfer</td>
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</table>

Focus of This Report

Although all studies claim to be providing reasonable lists of CSFs, apparently, none of them covers the entire spectrum of issues as suggested by one another. This reflects the inconsistent list of CSFs for PPP, and thus compromises the accuracy of performance assessment and early identification of potential risks.

This report, as the first step of a systematic study to structure a robust rule break to estimate the process for the establishment of PPPs, aims at producing a heuristic list of CSFs from previous studies and a concise and reasonable way of categorising these CSFs. A two-round Delphi is then scheduled to improve the robustness and comprehensiveness of the list and categories as the following step.

From the perspective of generic project management, strategic consideration and the complexity of projects are always considered as criteria for grouping, e.g. project management knowledge is
divided into strategic level and functional level in PMBoK for work with different scope, and the complexity of work is reflected by the scope of work as project, programme, and portfolio.

Time and function related criteria are also frequently adopted for categorisation purpose. A typical time related grouping example is given by Qiao et al., (2001) about categorising CSFs according to project life cycle stage. Function related criteria are often adopted by text books, such as the PMBoK, to group project management techniques used to manage projects. Both time and function related criteria limit their applications as appropriate means for CSFs of PPP. This is largely due to the considerable variations of procurement strategies existing and different functional expectations associated with the PPP processes.

The Seven Forces Model

The seven forces model (Figure 1) developed by Turner (2008) from Morris work suggests grouping seven forces acting on a project under three titles:

1. External context;
2. Project strategy; and
3. Internal implementation.

![Seven Forces Model](image)

Figure 1 Seven Forces Model (Turner, 2008)

The category of “external context” imposes two forces: “external influences” and “sponsorships and schedule”. This category covers environment of investment (such as political, social, legal and
environmental), technical aspect, and economic considerations by the first force. It also includes financial conditions and participants in the second force.

“Project strategy” addresses the strategic importance of a project and the strategy to undertake. This category links the external context and the internal implementations with two forces: “definition” and “attitudes”. Basically, this category portrays the expectations of the project and available supports given from all parties.

“Internal implementation” considers the performance driving forces: people, systems, and organisation. International relationships between participants, allocation of responsibility and authority, as well as management resources are all grouped into this title. This category reflects the characteristics of the project and is therefore an importance aspect to assess the project performance.

This method (the seven forces model) can overcome the insufficiency of the PMBoK (Morris, 2002) by giving special consideration to the context and strategy of a project. By measuring the performance of a project against these three categories of CSFs, we can get a comprehensive and appropriate structure of rule break and a systematic estimation can be achieved.

The Proposed Categorisation of Critical Success Factors
We then attempt to group the CSFs identified from review into three categories with corresponding scopes specified as following:

1. External context. CSFs in this category reflect the external environment of a PPP process. This category can be used to measure the performance of a project influenced by the external authority and any soft system associated with the project. Although the project itself alone may not be able to change the external context, its performance is sensitive to such CSFs and it is important to judge project outcomes on comparable external contexts.

2. Project strategy. Project boundaries are drawn by considering both the external context and the internal implementation. CSFs in this category measure the appropriateness of the strategy and the alignment of the project internal drivers and external environment.

3. Internal implementation. This category examines the characteristics of a PPP process, and focuses on the performance within the scope specified by the strategic boundaries. CSFs in this category should be updated according to the other two categories to best optimise the structure of performance assessment. The internal processes adopted, people element and contractual arrangement remain the main part of CSFs of internal implementation.
Relationships of Critical Success Factors

Identification of the relationships between CSFs between categories and within categories is another factor impacting the accuracy of estimation. On comparing with the other two categories, external context normally has the highest stability (Figure 2).

The investment environment does not change as frequently as project characteristics. However, the subsequent influences on the CSFs in the other groups should be carefully considered once the external context CSFs changed (Figure 2). On the country, CSFs of internal implementation may change from one project to the other. Consistency should be kept in the selection of CSFs in this category, or at least a comparable basis should be maintained between implementations. Project strategy measures a two-way alignment between external and internal factors. It updates the project boundaries and the internal CSFs according to external changes, and also refines the current strategy with constraints addressed by different project characteristics.

Figure 2 Stability, Influences and relationships of CSFs in Different Categories

All CSFs listed in Appendix 1 are further categorised into the three groups: external, strategy, and internal in accordance with the definitions provided above. Based on this categorisation, the list of CSFs and detailed relationships between them can be improved and refined through the proposed research process.
The Potential Research
Potential research process including:

1. A two-round Delphi survey to consolidate the list of CSFs and to refine relationships between CSFs and categories.
2. In depth review of the inherence and explanation of each CSFs and the corresponding importance from previous studies.
3. Localisation of international experience and research outcomes to Australian PPP applications.

References:


## Appendix 1 Initial List of CSFs from Previous Studies

<table>
<thead>
<tr>
<th>CSF</th>
<th>Economic viability</th>
<th>Appropriate risk allocation via reliable contractual arrangements</th>
<th>Sound financial package</th>
<th>Favorable investment environment</th>
<th>Reliable concessionaire consortium with strong technical strength</th>
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<td>Long-term demand for the products/services offered by the project</td>
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<td>Sufficient profitability of the project to attract investors</td>
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<td>Multi-benefit objectives</td>
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<td>Long-term cash flow that is attractive to lenders</td>
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<td>Long-term availability of various suppliers needed for the normal operation of the project</td>
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<td>Limited competition from other projects</td>
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<td>Concession agreement</td>
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<td>Appropriate risk allocation and risk sharing</td>
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<td>Commitment/responsibility of public/private sectors</td>
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<td>Shared authority between public and private sectors</td>
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<td>Loan agreement</td>
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<td>Guarantees/support/comfort letters</td>
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<td>Supply agreement</td>
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<td>Operation agreement</td>
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<td>Offtake agreement</td>
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<td>Design and construct contract</td>
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<td>Shareholder agreement</td>
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<td>Insurance agreement</td>
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<td>Appropriate toll/tariff levels and suitable adjustment formula</td>
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<td>Through and realistic cost/benefit assessment</td>
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<td>Accurate prediction of critical need for project</td>
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<td>Short construction and concession periods</td>
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<td>Sound financial analysis</td>
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<td>Strong financial commitments</td>
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<td>Lack of funds by host government</td>
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<td>Ideal candidate for privatization</td>
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<td>Abilities to deal with fluctuations in interest/exchange rates</td>
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<td>Potential to achieve near-monopolistic advantage for the products/services provided</td>
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<td>Sources and structure of main debts and standby facilities</td>
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<td>Flexibility for future growth and changes</td>
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<td>Long-term debt financing that minimizes refinancing risk</td>
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<td>Investment, payment and drawdown schedules</td>
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<td>Stable currencies of debts and equity finance</td>
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<td>Low financial charges</td>
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<td>High equity/debt ratio</td>
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<td>Stable political system</td>
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<td>Political support</td>
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<td>Government involvement by providing guarantees</td>
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<td>Favourable legal framework</td>
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<td>Sound economic policy</td>
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<td>Central coordinating governmental authority</td>
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<td>Government support</td>
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<td>Predictable and reasonable legal framework</td>
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<td>Favorable economic system</td>
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<td>The project is well suited for privatization</td>
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<td>Adequate local financial market</td>
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<td>Social support</td>
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<td>Promising economy/economic growth</td>
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<td>Supportive and understanding community</td>
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<td>Strong and capable project team</td>
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<td>Strong private consortium</td>
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<td>Proven solution</td>
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<td>Calculated risk-taker</td>
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<td>Well-organized public agency</td>
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<td>Good relationship with host government authorities</td>
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<td>Good governance</td>
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<td>Transparency in the procurement process</td>
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<td>Competitive procurement process</td>
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<td>Leading role by a key enterprise or entrepreneur</td>
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<td>Effective project organization structure</td>
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### Appendix 2 Categorised CSFs according to Turner (2008)

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<th>Category</th>
<th>External</th>
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<td>Long-term cash flow that is attractive to lenders</td>
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<td>Long-term availability of various suppliers needed for the normal operation of the project</td>
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<td>Limited competition from other projects</td>
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<td>Government involvement by providing guarantees</td>
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<td>Stable macro-economic environment</td>
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<td>Promising economy/economic growth</td>
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<td>Supportive and understanding community</td>
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<td>Abilities to deal with fluctuations in interest/exchange rates</td>
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<td>Calculated risk-taker</td>
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<td>Leading role by a key enterprise or entrepreneur</td>
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