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Identification of the Critical Success Factors for Maintenance Contracts with Target Cost Contracting

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1. INTRODUCTION

The construction industry has been subject to several shortcomings such as restricted trust, unbalanced risk allocation, win-lose climate, project delays (Moore, et al., 1992). Contracts tend to be awarded to the lowest bidders resulting in reduced profit margins (Moore, et al., 1992). As the disputes could have impact on the success of the work and on the contractual relationships of the contracting parties (Sertyesilisik, 2010), the contract type used and the procurement type selected as well as paying attention to their key success factors can influence the success of the construction projects. TCC (Target cost contracting) was identified by Eggleston (2009), Chan (2010), and Suttie (2010) to be the right procurement option to rectify the construction industry’s deficiencies. TCC strategies such as the ‘gain-shares/pain’ mechanism provide contractors with incentives to save cost and work efficiently. TCC was widely implemented as it was recognized as an approach which would improve working relationships among all contracting parties and team members, via the use of open book accounting. Factors contributing to the success of TCC need to be taken seriously by all participating parties (Chan, 2010). This paper aims at identifying the critical success factors for maintenance contracts adopting a target cost approach. Chan (2010)’s study on ‘Identifying the critical success factors for target cost contracts in the construction industry’ concentrated on the construction industry in general. The current research, on the other hand, is the first study that focuses on maintenance contracts specifically.

2. TARGET COST CONTRACTING

The construction industry has been subject to several deficiencies for a long period of time, such as unbalanced risk allocation, restricted trust and misalignment of objectives between contracting parties together with lack of incentives to improve project performance, leading to cost overruns, difficulty in resolving claims, a win lose climate and project delays (Moore, et al., 1992). Strong alarms have been raised because of the conventional practice of awarding contracts to the lowest bidders, which has resulted in low profit margins (Chan, 2010). This ongoing issue therefore has highlighted the need for a new approach to rectify the weakening situation. TCC is defined by the National Economic Development Office UK – Civil Engineering (1982) as follows: “During the course of the work, the initial target cost will be adjusted by agreement between the client or his nominated representative and the contractor to allow for any changes to the original specification. Any savings or overruns between the target cost and the actual cost at completion are shared between the parties to the contract”.

TCC requires that the details of the contractors tender pricing for any TCC subcontract work packages be made fully available to the client, usually through an ‘open book’ accounting agreement (Chan, 2010). The use of open book accounting regime enables better accountability and quantification of the costs of risk (The National Economic Development Office, 1982). TCC has introduced a unique feature into the construction contract called the pain/gain mechanism, known as the contractors share (Trench, 1991). The contractors share is not constant, and the client will vary the size of the share according to the contractors savings above or below the target. Eggleston (2009) explains there are risks and rewards from the share mechanism when the contractor enters into a target cost contract. Both the client and the contractor have to carefully consider the share percentages due to the commercial implications (Suttie, 2010). Brownyn (2009) highlighted that the client may not embrace the risk sharing philosophy and may attempt to use the share

CONSTRUCTION PROJECTS

KEYWORDS
Target cost contracting • Construction industry • Maintenance contract • Key success factor.

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ABSTRACT
Contract and procurement type as well as their key success factors influence the success of the construction projects. Target cost contracting and maintenance contracts are widely used in the construction industry. This paper aims at identifying the critical success factors for maintenance contracts, in particular those adopted a target cost approach. Two online questionnaire surveys have been applied to a sample consisting of industrial practitioners who had experience in the area of the study. The first survey aimed to establish new critical success factors that were not identified in the literature. The second survey asked the targeted industrial practitioners to rank the identified factors by their level of criticality. The experienced practitioners shared the opinion that the following factors were the most critical to the success of a maintenance contract adopting a target cost approach: correct / accurate (rates/norms) and the ability to review these during the length of the contract; good robust system in place for the collection of information such as labour and materials; high accuracy in relation to cost forecasting; understanding the amount of administration work that is required within a maintenance contract; incentive clause within the contract, so that the contractor has an incentive to reduce cost, while being awarded for increasing profit margins.
ranges as disincentive to prevent the contractor reaching beyond the total price. Commonly, the contractor’s focus is on negotiating both a high target price and favorable share percentages to minimize their financial risks. For contractors who consider TCC as another form of reimbursable contract, ‘there is a real danger’ that they can lose out of the financial risks of the target cost contracts (Eggerton, 2009).

In a typical target cost construction project, there are two types of varia-
tions and these are often pre-defined under the contract conditions (Gan-
der and Hemsley, 1997). These variations are design development and TCC variations (Gander and Hemsley, 1997). “Design development changes do not trigger a re-calculation of the target costs, as they are deemed to be included in the final lump sum of the contractors’ direct works finally at contract award. However, TCC variations can allow for a re-calculation of the target cost, and they will be valued in accordance with the measured works and schedule of rates” (Chan, 2010: 11).

Variations may occur in a target cost project due to (Fau and Greenwood, 2004): change of scope, change in function; change in quality; adjustment to provisional sums; corrected errors; unexpected additional fees or charges forced by statutory authorities. Chan (2010) highlighted that the contractor should offer to do his utmost to make the client aware of the value of the additional works and also the extension of time required.

NEC option 3 target contract with actively schedule is the most commonly used form of the main options of procurement available (Suttie, 2010). Drive for adopting TCC include: a price ceiling, a price share mechanism (Boukendour and Bah, 2001); involvement of contractor in design and build a liaison relationship with a TCC approach. TCC is a cross over design and build and traditional design and build contracts (Fau and Greenwood, 2004). TCC can bring contractor’s expertise in building design and innovations in construction methods or materials (Mansell and Butt, 2002). The contractor offers the clients an opportunity to exercise greater control over the process of design development and project cost contracting contractor’s expertise and innovations under a defined framework (Chan, 2010). Drivers for adopting TCC include: a price ceiling and reduced cost variations for client (Chan, et al., 2007); the gain pain share mechanism (Boukendour and Bah, 2001); involvement of contractor in design development (Chan, et al., 2007); an effective procurement strategy to conflict mitigation and resolution (Chan, et al., 2007); improvement of the working relationships amongst the project team members; cultivation of partnership and mutual trust between project stakeholders with the help of open book accounting (Chan, et al., 2007). Potential difficulties, however, can be encountered with TCC include: limited understanding of the TCC concept (Trench, 1991); target cost variations arising due to changes in the scope of work (Fau and Greenwood, 2004). Ten crucial success factors for guaranteed maximum price / target cost contracting include (Chan, 2010):

1. Reasonable share of cost saving and fair risk allocation
2. Partnering spirit from all contracting parties
3. A right selection of project team
4. Well defined scope of work in clients project brief
5. Proactive main contractor throughout the GMP/TCC
6. Early involvement of adjudication committee meeting
7. Familiarity with experience of GMP/TCC methodology amongst all contracted parties
8. Open book accounting regime as provided by the main contractor in support of his tender pricing
9. Establishment of adjudication committee meeting
10. Standard form of contract for GMP/TCC projects

3. RESEARCH METHODOLOGY

The research aimed to identify the critical success factors for maintenance contracts that have adopted the target cost approach.

Two surveys have been applied:
1. The first survey has been of an exploratory nature, with the use of open-ended questions to identify the key critical success factors.
2. The second survey has adopted a quantitative approach to confirm / validate the critical success factors for target cost contracting in maintenance projects.

Based on the first survey’s findings, it was possible to develop an updated list of critical success factors for TCCs that is more specific for maintenance contracts (which was created from the previous literature available, in particular Chan (2010)). The second survey was then created and sent out to selected sample of experienced professionals asking them to rate the level of criticality of each identified factor using the following ranking scale [1=not critical, 5=extremely critical]. The responses for the first and the second surveys have been presented in the Appendices 1 and 2.

The survey targeted professionals who had at a minimum experience working on a Target Cost Contract, but more specifically people who had experience working on TCC contracts that had adopted the TCC approach. 43 responses were obtained in the first round and 43 responses were received in the second.

4. RESULTS AND DISCUSSION

4.1. Data obtained from the first survey

(Q1 and 2) The first two questions were related with the survey respondents’ position with their company and the contracting party which best describes their work. The largest number of respondents by position was Quantity Surveyors, closely followed by Construction / Project Managers and Directors. Of the 11 Quantity Surveyors 8 were Contractors and 3 were clients.

(Q3 and 4) The results regarding the experience of the respondents in target cost contracts (Q3) and their experience in maintenance contracts (Q4) are summarized in Table 1.

(Q5) Table 2 demonstrates the level of agreement among the survey respondents with Chan (2010)’s identified success factors research. The majority of the respondents either agreed or strongly agreed that Chan (2010) identified factors will be somewhat critical.

(Q6) 45% of the respondents answered ‘yes’ and 55% answered ‘no’ to whether target cost contract- ing was ideal. About 30% of the respondents shared the opinion that, for target cost maintenance contracts was ideal. The respondents felt that ‘Well defined scope of work in client’s brief’ and ‘The importance of having an understanding of the amount of administra- tion work that is required’ are the 7 newly identified factors that were frequent.

(Q7) 62% answered this question with identify- ing a ‘win’, ‘win’ scenario when adopting the target cost contracting approach.

(Q8) 75% of the respondents believed that the maintenance contracts under target cost approach that they have worked on were successful, and 45% didn’t. This reveals that there is not a clear confi- dence in the target cost procurement approach for maintenance contracts.
The importance of the item 13 has been explained by one of the respondents as follows: “satisfaction.” Item 19 (Rank 3) “A right selection of project team” (mean = 4.31) has been identified by the majority of respondents as a critical success factor. Item 18 (Rank 2) “Well defined scope of work in client’s project brief” (mean = 4.36) and Item 19 (Rank 1) “High accuracy in relation to cost forecasting” (mean = 4.31) have been identified as top ten ranked critical factors. Furthermore, the clients identified “improved procedures in place such as time management” (mean = 4.05) as a very critical success factor. The use of open-book accounting throughout the Target Cost Contracting process (mean = 4.49) and Early involvement of the contractor in design development (mean = 4.47) were rated as highly critical by the respondents. The findings from this study indicate that a majority of the survey respondents believed that cost was not the best procurement option and advise that cost reimbursable should be considered. This is due to the need to reduce the administration burden on the contractors side. However, it is important to highlight that the cost reimbursable approach may not be in the clients’ best interest.

The survey respondents highlighted an additional 7 factors that were not considered in previous literature. The additional 7 factors identified in this study as very critical success factors include:
1. Correct / accurate (rates/norms) and the ability to review these during the length of the contract
2. Good robust system in place for the collection of information such as labor and materials
3. TCC carries an element of risk, which should be identified separately and managed accordingly
4. Incentive clause within the contract, so that the contractor has an incentive to reduce cost, while being awarded for increasing profit margin
5. Introduction of continual improvement through collaborative working
6. Careful resource planning
### APPENDIX 1

--- Survey 2 -- Ranking Critical Success Factors for Target Cost Contracting in Maintenance Contracts

<table>
<thead>
<tr>
<th>Critical Success Factor</th>
<th>Rank 1</th>
<th>Rank 2</th>
<th>Rank 3</th>
<th>Rank 4</th>
<th>Rank 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understanding of the scope of work</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Consultancy scope of work</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Feasibility and experience of Target Cost Contracting methodology amongst all contracting parties</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Importance of clear contract procedures in place as a whole</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>A tight schedule of project teams</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Reasonable share of cost saving and risk allocation</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Partnering spirit from all contracting parties</td>
<td>4</td>
<td>5</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Early involvement at the design development</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Proactive risk contractor throughout the Target Cost Contracting process</td>
<td>5</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

6. Do you feel that Target Cost Contracting is the best suited procurement method for maintenance contracts?
- Yes
- No
7. If you answered ‘no’ to the above question what procurement method do you think is the best suited?
- Reimbursable
- Lump Sum
- Other
- Other (please specify)

8. Would you consider that maintenance contracts you have worked on in the past, that have adopted the Target Cost Contracting Approach have been successful?
- Yes
- No
- Please elaborate...

9. Do you believe from your previous construction experience that the critical success factors will differ in maintenance contracts when adopting the Target Contracting Approach?
- Yes
- No
- Please elaborate...

10. From your experience working on Target Cost Contracts in particular Maintenance Projects can you identify any other critical success factors that are not mentioned in question 9?

### APPENDIX 2

--- Survey 3 --- Identifying Critical Success Factors for Target Cost Contracting in Maintenance Projects

<table>
<thead>
<tr>
<th>Critical Success Factor</th>
<th>Selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understanding of the scope of work</td>
<td>Yes</td>
</tr>
<tr>
<td>Consultancy scope of work</td>
<td>Yes</td>
</tr>
<tr>
<td>Feasibility and experience of Target Cost Contracting methodology amongst all contracting parties</td>
<td>Yes</td>
</tr>
<tr>
<td>Importance of clear contract procedures in place as a whole</td>
<td>Yes</td>
</tr>
<tr>
<td>A tight schedule of project teams</td>
<td>Yes</td>
</tr>
<tr>
<td>Reasonable share of cost saving and risk allocation</td>
<td>Yes</td>
</tr>
<tr>
<td>Partnering spirit from all contracting parties</td>
<td>Yes</td>
</tr>
<tr>
<td>Early involvement at the design development</td>
<td>Yes</td>
</tr>
<tr>
<td>Proactive risk contractor throughout the Target Cost Contracting process</td>
<td>Yes</td>
</tr>
</tbody>
</table>

4. What would best describe your experience with Maintenance Contracts?
- Under 1 year
- 1-2 years
- 2-5 years
- Over 5 years

5. Please identify the level of criticality, of each of the following factors to the success of Target Cost Contracting in maintenance projects - using the following ranking scale (1 = not critical, 2 = slightly critical, 3 = moderately critical, 4 = very critical and 5 = extremely critical)

<table>
<thead>
<tr>
<th>Critical Success Factor</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understanding of the scope of work</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consultancy scope of work</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
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<td>Proactive risk contractor throughout the Target Cost Contracting process</td>
<td>5</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

### REFERENCES


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