

What are the big issues in cost management?

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ABSTRACT

This paper presents the current big issues in cost management. It covers the theoretical aspects, the causes and effects, and possible countermeasures. This paper is a result of a literature review conducted during the initial stages of a doctoral research. In doing so, principles of lean production are considered as a basis for critical evaluation. Seven big issues have been identified as shortcomings in the current construction cost management approaches. Some of such issues identified are failure to forecast, failure to pinpoint improvement opportunities and poor support to inter-organizational cost management. Possible countermeasures are suggested to address the identified issues. This research is expected to contribute towards developing conceptual solutions for improving the cost management approaches.

KEYWORDS:

Cost management, lean, value, waste.

INTRODUCTION

Cost management can be generally considered as a set of techniques and methods for controlling and improving a company's activities and processes, its products and services, to achieve cost effectiveness (cost reduction, value improvement and substitution) by collecting, analyzing, evaluating and reporting cost information for budgeting, estimating, forecasting and monitoring costs, in order to assist decision making.

Since the seminal contribution by Kaplan and Johnson (1987), literature indicates extensive discussions highlighting the need for improvements in cost management. Through a review of such literature, this paper aims to establish and consolidate the big issues in construction cost management, especially when analyzed from lean production perspectives.

Following this introduction, each big issue is discussed in terms of introducing the issue, the causes, an explanation, and possible countermeasures. A discussion identifying areas of commonality, consequences of the weaknesses, and areas for improvement are identified. Finally, conclusions and further research directions are indicated.

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BIG ISSUES IN TRADITIONAL COST MANAGEMENT

FAILURE TO FORECAST

Forecasting is one of the key functions of cost estimation in construction projects. Zwikael and Smyrk (2009) have defined “project” as a form of investment in which outlays (approved by “funder”) are made today with the intention of realising a flow of benefits over some future timeframe. Cost estimation is used to establish the probable cost of a future project or product, before designed in detail and contract particulars being prepared. In this way, the client is made aware of the likely financial commitments before extensive design work is undertaken (Seeley, 1983) and it can help in providing correct input to him for making the correct decisions on future investments. Forecasting has been discussed as part of attempts to improve accuracy in estimating (Jaya et al., 2010, Rosenfeld, 2009, Beeston, 1986, Ballard, 2008, Kenley and Wilson, 1986). However, Flyvbjerg (2008) and Elfving et al. (2005) believe that these endeavours have not been fruitful.

Many causes of inaccuracy have been pinpointed in previous research. Traditionally, it is common for building owners to decide on relatively detailed issues at the beginning of the project delivery process for the preparation of tender documents. There is a high possibility that the detail issues in the design at this early stage will change along the project delivery process, hence causing a considerable amount of waste in terms of time, information provided, and waste created during construction due to design faults (Elfving et al., 2005). In addition, cost is just understood to be there and the focus is on targeting for the ‘expected cost’ and not for ‘targeted cost’. Flyvbjerg (2008), introducing the term “dark side of forecasting”, points out unethical practices such as project champions / person in-charge (planner & the politicians) proceeding with projects even when inaccuracy in estimating is detected at the outset.

Currently, most of the cost data are taken from previous projects, which inherit waste. Such waste can be in varying amounts due to the emerging nature of waste. This fact is not acknowledged when compiling and using cost data, thereby resulting in inaccuracies in cost estimates.

Therefore, a possible countermeasure is to develop cost management approaches which account for the emergent nature of waste in the total construction process.

FAILURE TO PINPOINT IMPROVEMENT OPPORTUNITIES

Current practices have witnessed many estimators being more keen on getting projects to be funded and built (Flyvbjerg, 2008) rather than getting the forecast right. In addition, early commitments to design solutions have established cost at the initial stage. Locking the cost and the design, reduces the opportunity to decrease the cost during construction, even though many authors have agreed that 70%-80% of product costs are committed during the concept phase (Rush and Roy, 2000). It is also highlighted that making a wrong decision at this stage is extremely costly further down the development process where product modifications and process alterations are more expensive. This situation may significantly increase resource consumption and generate waste (i.e., waiting and rework) (Elfving et al., 2005, Koskenvesa et al., 2010) and also reduce the product flexibility.

Causes of this issue include referring to cost data from sources such as Spon's Construction Price Book and BCIS (Building Cost Information Service), where information taken from previous projects include inherent waste. The usage of such data seems to slow down the growth of the labor productivity (Koskenvesa et al., 2010). In addition, Elfving et al. (2005) reported that decisions on early detailed issues in design might increase the probability of changes later on, which often leads to suboptimal solutions, quality defects and rework and this indirectly will contribute wastes in the process. In addition, initiatives in cost reduction have focused more on direct labor time instead of overhead cost where costs are actually increasing most rapidly (Kaplan and Johnson, 1987).

Koskela and Tommelein (2009) argued that cost can also be influenced along the entire project delivery. Target Value Design techniques (Kim and Ballard, 2000, Ballard and Reiser, 2004), which can influence the cost along the project delivery process, is one solution that can be adopted.

COSTS ARE SHAPED BY ACTION RATHER THAN RESULT FROM ACTION

Kirkham (2007) points out that traditional cost planning will usually follow the conventional process structure of outline design, detailed design. This cost plan (estimate) is the basis of cost control.

Conventionally, cost control techniques are used during the design stage to enable the architect to be kept fully informed of the cost implications of all his design decisions, and throughout the construction period in order to rectify mistakes resulting by the action of the parties at the early stage of the project (Seeley, 1983). This situation, which set strategies based on the client's requirements, earlier on before the project started is referred to as the 'cost result from action' thinking and arguably leads to increased inaccuracy, creation of waste and also failure to achieve cost reduction.

Cost can be influenced in a positive way by the actors throughout the project delivery process. Therefore, it can be established that costs are 'shaped by action', and it is possible to make the design converge to an acceptable overall project cost rather than letting the cost reflect the design.

Adopting target value design (Ballard, 2010), which drives design to deliver customer values and develops design within project constraints, can influence cost along the project delivery process, in contrast to only predicting costs at the beginning of the project.

RELATIVE NEGLECT OF VALUE CONSIDERATION

When browsing through the index in books (Brook, 2008, Hillebrandt, 2000, Seeley, 1983), which are related to cost management, a missing discussion in value aspect can be witnessed. Traditionally, value has not been addressed in construction cost management, although many feel that the important criterion of value should be taken into consideration. The only problem is that they do not know where and how to do it.

Value consideration is necessary for construction project for allowing to achieve the best value for money by eliminating unnecessary costs and functions while maintaining and optimising the performance. Studies in value have addressed the provision of 'value' but ignored the concept of value from the customer's

perspective (McNair et al., 2001). Activity-based management approaches (Kaplan and Cooper, 1998) are used to divide the activities and costs of the firm into value-added or non-value-added categories, but it remains unclear whether and how customers' perspective is embedded into these approaches (McNair et al., 2001). The use of target costing (Tanaka et al., 1993) is considered of very limited value (Ewert and Ernst, 1999) to the overall cost management even though it relates cost to product attributes and its primary aim remains in cost minimization and value as proxy by market price is used only to define allowable costs (McNair et al., 2001).

All these techniques do not enable an identification of which activities should be emphasized and provide no assessment of specific linkages between internal cost structure and externally defined value (McNair et al., 2001). In summary, looking at the issues mentioned above, each tool mentioned fails to fully explain the complex relationship between cost and value (McNair et al., 2001).

It is suggested that the continuous monitoring of loss of value is needed by creating a better alignment between cost and value for helping the firm target areas where costs can best be leveraged to improve its overall profit potential (McNair et al., 2001). It started from the design stage until the construction stage for the success of value towards client's requirement. Continuous monitoring of loss of value is needed because cost management system is not aligned with the development in production process and value is not considered in it. Benefit realization management (Yates et al., 2009) and Choosing by Advantages (Suhr, 1999) are other alternative approaches to get the optimum result of project/product.

POOR SUPPORT FOR INTER-ORGANIZATIONAL COST MANAGEMENT

Currently, many-tiered supplier networks exist in traditional supply chains (Cooper and Slagmulder, 2004), where the connection between key supplier's suppliers, key supplier's other customers, customer's other suppliers' and customer's customer (Dubois, 2003) exist. These many-tiered supplier networks create a major addition in transaction cost until it reach the final customer, and it is believed that customer carries mostly the burden of cost accumulation in traditional supply chains (Kulmala et al., 2002).

The costs of purchased goods and services represent the majority of total costs for most companies (Dubois, 2003). Therefore, outsourcing purchased goods mostly happen chasing the lowest price for each transaction. All of these goods and services are purchased from supplier organizations and the purchases from supplier organizations are the largest single expenditure for most firms. This high share is attributable to the ambition of companies to concentrate more on their specialisation (Dubois, 2003). Furthermore, as time goes by, outsourcing of manufacturing activities has been followed by outsourcing of design and development work and therefore, suppliers are contributing to the technical development of a company (Dubois, 2003). Moreover, applying new techniques such as JIT (Just-In Time) and TQM (Total Quality Management) require active involvement of suppliers and affects the costs and benefits of both buyer and supplier (Dubois, 2003).

The cost management problems caused by the many-tiered supplier networks can be alleviated by adopting relational oriented philosophies (Kulmala et al., 2002, Kulmala, 2004), applying open book accounting (Kulmala et al., 2002, Seal et al., 1999) and redefining of the unit of analysis (Dubois, 2003, Cooper and Yoshikawa,

1994, Christopher and Gattorna, 2005, Cooper and Slagmulder, 2004, Zimina and Pasquire, 2010, Cabral and Riordan, 1989).

NEGATIVE INFLUENCE ON BEHAVIOUR

Several forms of negative influence from cost management systems on behaviour have been identified in literature, ranging from claim culture to manipulation of bids and performance measurements. Attitudes that relate to the occurrence of claims in the administration of contracts show that the industry has a culture that is opportunistic, prone to conflict and resistant to change (Rooke et al., 2003). People draw on whatever resources they can to make the best out of a bad job in order to get by and get things done to make extra profit or money (Rooke et al., 2003). There are contractors who expend more effort on generating profit from claims than from improved construction methods (Rooke et al., 2004).

Another example is 'unbalanced bid', which has the tendency to create cash constraints to many parties, such as cash flow problems to contractor (Tucker, 1986, Ali and Elazouni, 2009, Qingbin et al., 2010, Chen et al., 2008, Elazouni, 2009), financial disorder to client (Christodoulou, 2008) and also to both parties, when managing more than one project (Lu et al., 2007). This whole example will create a false alarm. In addition, the earned-value method, which is developed for integrating schedule and cost management, creates the opportunity to project managers to manipulate work sequences when releasing work to the field. In this situation, it may be work assignment that are not shielded from uncertainty are release for the sake of early payment (Kim and Ballard, 2000).

The blame is not only on contractors' part but can also happen because of client behaviour. Consistently, late payments by clients have encouraged contractors to act negatively because of the resultant cash constraints problems that they have to face.

Some countermeasures were suggested by Arditi and Chotibhongs (2009), Christodoulou (2008) and Cattell et al. (2008), where models were suggested to overcome the problem of unbalanced bid. Adoption of procurement methods that discourage claims, and open book accounting (Kulmala et al., 2002, Seal et al., 1999) are another possible solutions available.

BUDGETING IN DYNAMIC SITUATIONS

The budgeting emerged in the 1920s as a tool for managing costs and cash flow in large industrial organizations such as DuPont, General Motors and Siemens. Budgets are also used extensively in construction contexts too. Currently, a number of companies have recognized the full extent of the damage done by budgeting (Hope and Fraser, 2003b). They have rejected the reliance on obsolete data and the protracted, self-interested wrangling over what the data indicate about the future because it render pointless interpretation and circulation of current market information, the stock-in-trade of the knowledge-based and networked company.

Having a budget in a business unit, have created negative scenarios among employees in an organization because each and every activity involved in the product delivery process will be benchmarked with a budget. This will disempowers the front line, discourages information sharing, and slow the response to market developments until it's too late (Hope and Fraser, 2003a). The usage of budget, which is at first to force performance improvements, have lead to a breakdown in corporate ethics where

information is only funnel to those with a “need to know” and not the rest of the team (Hope and Fraser, 2003b).

In the absence of a budget, alternative goals and measures are move to foreground and business units and personnel performance is judged on how well its performance compares with its peers’ and against world-class benchmarks that is collected and prepared by specialist firms that understand the particular industry. The result of this adoption has created more accurate interpretation of results (Hope and Fraser, 2003b).

Traditionally, early creation of a budget has been emphasized in construction project management. However, the dynamic situations in construction projects may demand a more flexible and a responsive approach to budgeting. A possible countermeasure is to develop cost management approaches which take the above in to consideration.

DISCUSSION

When analysing the big issues, some common causes can be identified. They can be divided to four subsections, i.e. assumptions on how cost emerge, assumptions on management need for cost information, assumptions on conditions or context in cost management and how contract is formulated and payments arranged (Table 3).

Table 3: Common causes in the seven big issues

COMMON CAUSES	OUTLINE OF COMMON CAUSES	BIG ISSUES FEATURED
Assumptions on how cost emerge	Key underlying assumption is: Costs do not cover any avoidable waste	<ul style="list-style-type: none"> • Costs are shaped by action rather than result from action • Failure to forecast • Negative influence on behaviour • Poor support for inter-organizational cost management • Failure to pinpoint improvement opportunities
Assumptions on management need for cost information	Key underlying assumption is: Cost information is only needed for decision-making	<ul style="list-style-type: none"> • Poor support for inter-organizational cost management • Failure to forecast
Assumptions on conditions or context of cost management	Key underlying assumptions are: Design and production occur in a static environment. The same value will be achieved through alternative course of action.	<ul style="list-style-type: none"> • Relative neglect of value consideration • Budgeting in dynamic situations • Costs are shaped by action rather than result from action
How contract is formulated and payments arranged	Contract or payment arrangement creates an incentive for one party to manipulate design and production to its own advantage.	<ul style="list-style-type: none"> • Negative Influence on behaviour • Costs are shaped by action rather than result from action • Failure to forecast

The consequences of the big issues in cost management do include inaccurate price of a project/product, suboptimal solutions, quality defects and rework, reduced growth of labour productivity (Koskenvesa et al., 2010), reduced product flexibility, increased resource consumption, making wrong decisions, cost accumulation to the customer, cash flow problems and bad financial planning.

These big issues have exposed significant weaknesses in the traditional cost management approaches. Based on the literature review findings, it seems that many parties have realised these problems that have existed in the current cost management system. Yet, hardly any of the initiatives that have been put forward seems sufficient as such for achieving a needed overhaul of the function, role and philosophies of the cost management system. Transparency of the cost and the thinking out of the box are required in order to improve. In addition, structural changes such as improvement in training and education towards the purported changes and revision of the procurement policies are suggested as well.

CONCLUSIONS

Effective cost management is important for the achievement of the investment put forward by the sponsor of the project. Therefore, in order to provide accurate guidance to the decision maker in initiating and making their decision, consideration of value, achievement of maximal accuracy and reduction in cost are very important to be achieved in every cost estimation exercise. This paper sees that the real problem to the success of cost management is to find ways to reduce the amount of wastes that are embedded in the current construction costs. Informed by this review, the future direction of this research is to develop conceptual solutions to the current problems in construction cost management identified here.

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