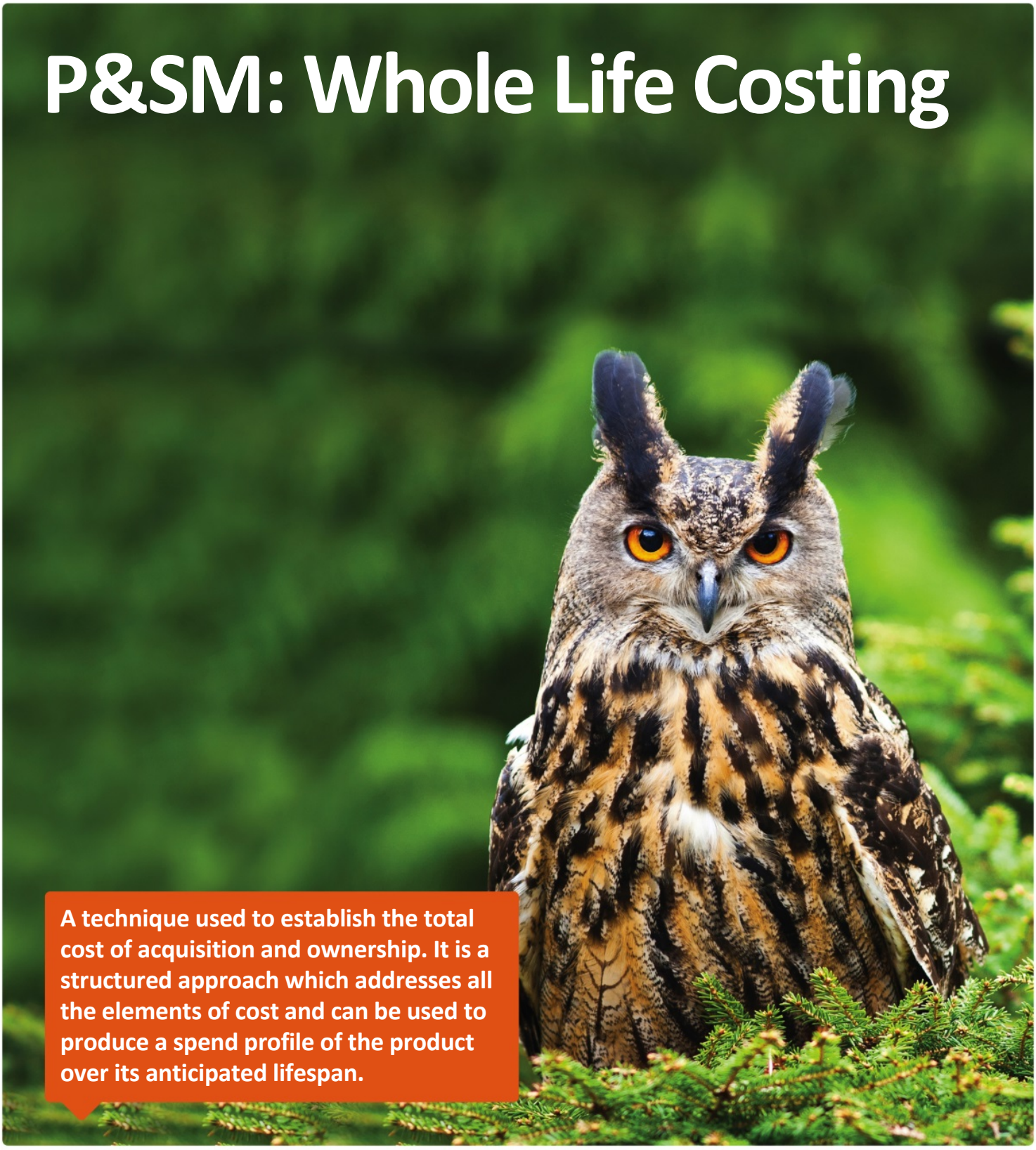
P&SM: Whole Life Costing



A technique used to establish the total cost of acquisition and ownership. It is a structured approach which addresses all the elements of cost and can be used to produce a spend profile of the product over its anticipated lifespan.

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Introduction

The CIPS' practice documents are written as a statement in time. They are a collection of views on good practice within a particular subject area and are intended to provide direction on good practice with some guidance for context and interest. The reader is encouraged to use the CIPS practice documents for their own purposes, such as writing policy statements, guidance or procedures. This particular practice statement has been written primarily for the benefit of full-time purchasing and supply management professionals, but can be used by anyone associated with, or interested in, purchasing and supply management (P&SM).

This document is about whole life costing (WLC).

Definition

WLC is a technique used to establish the total cost of acquisition and ownership. It is a structured approach which addresses all the elements of cost and can be used to produce a spend profile of the product over its anticipated lifespan.

The results of a WLC analysis can be used to assist management in the decision-making process when there is a choice of product. The accuracy of WLC diminishes as it projects further into the future, so it is most useful as a comparative tool when long term assumptions apply to all the options and consequently have the same impact.

WLC also involves the use of a discounted cash flow calculation which is defined as the process of evaluating the future net cash flows from expenditure and any income from potential sale value generated by a project or plant during its expected life cycle by discounting them back to their present date value.

Finally, value analysis, which is a systematic interdisciplinary examination of design and other factors affecting the cost of a product or service in order to devise a means of achieving the specified purpose most economically at the required standard of quality and reliability, is a key component in WLC especially in the case of plant.

Background

Important though it is as a technique, WLC needs to be seen in the context of other cost analysis approaches such as target costing, absorption costing and activity based costing.

- Target costing - A product cost estimate derived from a competitive market price. Used to reduce costs through continuous improvement and replacement of technologies and processes.
- Absorption costing - A method of costing designed to ensure that total costs, fixed and variable, direct and overhead are recovered in the price of goods etc.
- ABC Activity Based Costing - A cost attribution to cost units on the basis of benefit received from indirect activities such as order processing and setting up quality procedures.

Explanation

CIPS advocates the use of WLC when deciding whether a requirement should be 'made or bought' and also when determining the source which offers the best value for money.

The following three basic principles are fundamental to WLC:

1. An analysis of the cost structure - any such analysis should ensure that all the cost elements are readily identifiable
2. Cost estimating - having produced a cost structure, it is necessary to work out the costs for each category; various techniques are available, one being the use of CERs (Cost Estimating Relationships)
3. Discounting - the application of a selected discount rate such that each future cost is adjusted to the present time (i.e. the point at which the purchase decision is made)
4. Inflation - this is listed here only to emphasise that it should not be confused with discounting. As long as inflation affects aspects of the purchasing decision more or less equally, it is usual to exclude it from a WLC analysis

WLC takes account of the total costs of making or purchasing and then owning (or leasing), operating, maintaining and managing the requirement's end of life (whether that involves decommissioning, disposal or re-sale) over a specified period of time. These costs are assessed to provide a rational comparison of alternative means of meeting the requirement.

Some suggestions and examples of the types of individual costs to consider in WLC, in particular in relation to the purchase of supplies and services, include:

Pre-acquisition costs:

- Investigation of the marketplace
- Specification and design
- Budget allocation
- Preparation and issuing of invitation to tenders
- Cost of tender evaluation
- Cost of letting contract
- Preparation for receipt of the requirement (e.g. changes to room size for accommodation purposes)

Acquisition costs:

- Purchase price
- Delivery charge
- Insurance and taxes (including the impact of benefit in kind if applicable, e.g. Cars)
- Installation and commissioning
- Training and support
- Internal costs of changing from the incumbent supplier (which should be identified prior to tenders being received)

Operating costs:

- Labour
- Materials
- Consumables

- Energy supply and consumption
- Contract and supplier management
- Transaction costs
- Environmental costs
- Cost of change e.g. using an alternative material with equipment

Maintenance costs:

- Specialist labour
- Specialist tooling
- Spare and replacement parts
- Reduced output with age
- Frequency of maintenance and recommended downtimes
- Servicing and inspection regimes

Downtime costs:

- Lost profits
- Extra costs of overtime or sub-contracting
- Costs associated with breakdown of equipment
- Claims resulting from non-performance
- Temporary replacement

End of life costs:

- Safe disposal
- Re-sale
- On-going liabilities
- Decommissioning
- Removal for sale or scrap

CIPS believes that there is no single approach to WLC and any WLC tools employed by an organisation may vary according to the specific nature of the requirement. For instance, the tool used to determine the best value for money in the procurement of a piece of software might be very different from that used to evaluate the procurement of capital equipment. There are several 'tools' available involving spread sheets and discounted cash flow calculations. P & SM professionals can either purchase such a tool or develop their own. At its simplest level, a spread sheet could be produced for the requirement with all the elements of cost individually listed along the rows and the suppliers listed down the columns.

These costs can be as detailed as required, but at the very least they should cover:

- Acquisition and all its components (delivery costs, installation costs, commissioning costs, hire or lease costs, outsourcing costs, etc.)
- Operating costs and all its components such as energy, spares, costs of maintenance
- End of life costs such as de-commissioning and removal costs
- Timing of cost incurred

CIPS suggests that the cost elements can be weighted according to the degree of impact on the organisation or their importance to the organisation. These weightings should be reviewed on

a case-by-case basis along with other variables, such as lifespan or the discounting method used.

CIPS recommends that the expected usage life rather than the expected physical life of the asset should be employed in WLC. This is particularly important when undertaking Net Present Value (NPV) or discounted cash flow calculations. The selection of an appropriate discount rate is critical. CIPS suggests that, as a rule of thumb, the current long-term expected interest rate minus the current long-term expected inflation rate should be the discounted rate employed. P & SM professionals should be very careful if considering moving away from this method of ascertaining the discounted rate.

Information Required

The information required to undertake WLC may not be readily available and research may be required involving, for example, the supplier and other customers of the supplier particularly for information about their experience of using the requirement in question. However, once such information is obtained it can be used in other WLC exercises for similar procurements. The time and effort involved in data collection to make WLC effective and useful can be so considerable that it could be argued that WLC is most appropriate for high value and high risk procurements.

However, where data is readily available, and therefore WLC is not highly resource consuming, there is no reason why it cannot be applied to lower value purchases as a means of determining the best value for money option. CIPS suggests that Invitations to Tender (ITT) should include a template or questionnaire for suppliers to complete which shows the costs associated with the requirement for which they are submitting bids. This is good practice both in the negotiation stages and also for WLC. Cost information required should include a breakdown of overheads, margins, production and operating costs, energy consumption, maintenance costs, disposal costs, etc.

Suppliers may of course be unwilling to provide such information, especially if the buying organisation does not place regular business with them. Such information is usually more readily obtainable from suppliers with whom the buying organisation has a partnering style relationship (reference should be made to the CIPS position on practice on partnering which is also available from this site).

Costing information can also be sought from existing customers of the supplier in question by contacting them to obtain, for example, details of running costs. Similarly, the actual costs incurred during the life of the requirement should be monitored and recorded to inform future purchasing decisions. This is particularly important in high-value procurements, such as construction.

CIPS advocates the development of a WLC database so that costing information can be re-used as appropriate. Depreciation and re-sale are particular issues that need to be addressed and as such P & SM professionals may require the expert guidance of colleagues in Finance or external specialists. For example, similar solutions may not have similar depreciation curves and in some cases cross-overs in respect of costs versus income, although their re-sale value may be the same.

Cost/time graphs can be drawn to illustrate when different costs impact over the life of the requirement. There are several different approaches and colleagues who are qualified accountants are best placed to provide guidance on the appropriate use and application of discounted cash flow techniques. Liaising with colleagues in Finance and Internal Audit for example, may assist P & SM professionals employed in organisations with devolved budgets, to overcome the problem whereby different parts of the organisation are responsible for costs at different points in the life of the requirement.

In such circumstances there is sometimes a tendency for a budget centre to consider its own costs to the detriment of another budget centre rather than deciding on the best overall value for money for the organisation.

Other Issues to Consider

Other issues to consider in WLC include a risk assessment and sensitivity analysis. CIPS suggests that the larger the commitment, the more sophisticated should be the analysis. Construction in particular requires close attention to exit strategies, including the costs of decommissioning at the end of the life of the building.

CIPS recommends that the expected usage life, rather than expected physical life, should be preferred parameter when making WLC calculations. This is especially true in construction, where the WLC should be determined in terms of the purpose for which the construction is procured rather than how long the building is expected to remain standing (reference should be made to CIPS positions on practice on construction client's policy which is also available on this website).

An analysis of an existing business process using whole life costs in terms of staff time, processes and timescales in general can lead to the development of a more viable and more cost effective alternative. An example would be the replacement of a fuel expenses reimbursement system with the adoption of fuel cards, similarly the effects of salary sacrifice schemes (e.g. for cars) can be considered. The resultant value added benefits such as improved management information and contented colleagues, not least cost savings e.g. reduced fuel and better allocation of resources, can be apportioned over the life of the new process i.e. year on year savings resulting from the decision to adopt the new process.

CIPS also suggests that when applying WLC to Private Finance Initiative projects, or similar complex procurements, WLC should be employed in a more sophisticated manner than, for instance, that used for capital purchases. This would require a review of the whole commercial deal including assessment of important 'soft' issues such as culture, staff reaction, dependability, ultimate aims and strategy.

Benefits of WLC

WLC is particularly important at the present time when the rate of technological change is continually increasing. Certain products may become outdated within a year or less of acquisition. Wherever it is employed, however, the use of WLC ensures that the pitfalls of using initial cost as the sole criterion are avoided.

There are four key benefits associated with WLC:

1. Evaluation of competing options - WLC is relevant to most equipment purchasing decisions, whether simple or complex and the technique is also applicable to leasing decision
2. Better awareness of total costs - WLC has been shown to provide buyers and decision makers with a better awareness of the factors governing cost and the resources required associated with the purchase
3. Better forecasting - WLC allows the full cost of a purchase over a period of time to be calculated with reasonable accuracy; this is of considerable importance when major investment decisions need to be made
4. Performance trade-offs against cost - using WLC it is relatively straightforward to assess the reliability characteristics of a piece of equipment in the context of its cost profile

Disadvantages of WLC

1. Whilst it is usually straightforward to ascertain the initial cost of a product, WLC can, at least in theory, also identify and quantify subsequent on-going costs. In practice this is often easier said than done, not least because as a product goes through its life cycle a whole range of cost considerations come into play, including initial product design development costs, marketing, advertising, product redesign and product replacement
2. In strategic purchasing decisions WLC suffers from the problems that in such cases future costs are in reality approximate being as often as not based on projected sales figures which are frequently over-optimistic
3. Using WLC analysis can involve considerable expenditure in terms of manpower. This can be the case even when computerised procedures are employed

The P & SM Professional's Role

The CIPS position is that P & SM professionals should be competent in the theory and application of WLC. It can be a complex commercial process which, when used properly, enables P & SM professionals to demonstrate a significant and visible contribution to their organisations' financial standing and thereby raise the profile of the profession.
CIPS believes that the P & SM professional should lead the WLC process and involve appropriate colleagues by means of a cross-functional team. P & SM professionals should openly share their WLC approach and invite others to contribute towards its development.

CIPS suggests that P & SM professionals should actively promote and educate colleagues in the concept of WLC by, for example, providing road shows or training seminars to demonstrate that price is just one element of cost. They should begin by marketing the concept to the Chief Executive Officer, Board of Management and Internal Audit with the aim of obtaining a top down visible policy, applicable to the whole organisation, on the use of WLC and other approaches to costing as appropriate to different procurements.

Further, CIPS believes that the P & SM professional should involve key suppliers in the WLC policy with a view to engaging them in the process and extracting relevant costing information from them in due course. This may lead to closer working relationships and, potentially, partnering style relationships in which suppliers can be developed for mutual benefit between both parties e.g. the buying organisation and the supplier can work together to take cost out of a product, service or construction.

CIPS believes that it is not sufficient to simply persuade colleagues and others within supply chains as to the value of WLC, it is necessary to ensure its implementation and appropriate use within an organisation. It is a key responsibility of the P & SM professional to endeavour to prevent high value and high risk purchasing decisions being made on the basis of price alone.

Conclusion

WLC is a key P & SM tool, is very effective in decision-making processes and should factor in any major decision by P & SM professionals. However, it is just one aspect of good practice P & SM and other elements should be considered in the procurement process. Examples of other considerations include the supplier selection criteria, such as a supplier's financial standing, capacity, and track record as well as the quality and integrity of the product in question.

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